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<212> PRT
<213> Streptomyces aizunensis

<400> 19

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Trp Ala Leu Arg Ser Ala Gly His Glu Val Leu Val Ala Ser Ala Gly
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Asp Ala Leu Glu Ala Ala Asn Ala Gly Leu His Val Ala Asp Val Ala
35 40 45

Pro Gly Phe His Leu Glu Asp Phe Leu Gln Ser Thr Ala Gly Glu Leu
50 55 60

Met Ala Arg Leu Arg Gly Pro Gly Gly Val Asp Pro Met Asp Gly Leu
65 70 75 80

Thr Leu Phe Ala His Leu Asn Asn His Leu Ala Asp Gly Ile Val Arg
85 90 95

Thr Ala Asp Asp Phe Arg Pro Asp Leu Ile Val Phe Glu Gln Ile Phe
100 105 110

Val Ser Gly Leu Ile Ala Ala Ala Arg Leu Gly Val Pro Ala Val Gln
115 120 125

His Asn Phe Gly Phe Ala Arg Gly Thr Gln Leu Arg Glu Leu Thr Val
130 135 140

Ser Met Leu Thr Glu Thr Met Ala Arg His Gly Val Asp Arg Val Ser
145 150 155 160

Glu Arg Val Pro Val Ile Asp Ile Ala Pro Pro Ser Met Ala Glu Pro
165 170 175

Glu Arg Asp Gly Trp Ser Met Arg Pro Val Pro Tyr Asn Ser Gly Ala
180 185 190

Val Leu Pro Asp Trp Leu Leu Glu Lys Pro Gly Arg Arg Arg Val Gly
195 200 205

Val Thr Leu Gly Thr Ala Ser Val His Ile Asn Gly Leu Gly Pro Val
210 215 220

Gln Arg Leu Ala Ala Ala Ala Ala Gly Val Asp Ala Glu Phe Val Leu
225 230 235 240

Ala Leu Gly Asp Val Asp Thr Thr Ala Leu Gly Glu Leu Pro Pro Asn
245 250 255

Val Arg Ala Val Gly Trp Val Pro Leu Thr Ala Leu Leu Gln Thr Cys
260 265 270

Asp Ala Ala Val His His Gly Gly Ala Gly Thr Thr Leu Ala Ala Leu
275 280 285

Asn Ala Gly Val Pro Gln Leu Val Leu Pro Asp Gly Ala Asp Arg His
290 295 300

Ile Asn Ala Glu Ala Val Arg Asp Arg Gly Ala Gly Leu Leu Gly Thr
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Ala Asp Asp Leu Ser Ala Glu Val Leu Val Gln Leu Leu Ser Asp Glu
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<400> 21

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Glu Val Gly Gly Thr Gln Gly Glu Ser Pro Glu Ser Thr Pro Ser Trp
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Gln Gln Arg Leu Thr Gly Leu Thr Glu Ala Glu Gln His Thr Ala Leu
35 40 45

Leu Glu Trp Val Ser Ser Leu Ala Ser Ala Ala Leu Arg Asp Ala Ala
50 55 60

Pro Asp Thr Leu Asp Pro His Arg Pro Phe Leu Asp Leu Gly Phe Asp
65 70 75 80

Ser Leu Ala Ala Val Asp Leu His Ala Arg Leu Val Ala Gly Thr Gly
85 90 95

Leu Arg Leu Pro Val Thr Leu Ala Phe Asp His Pro Thr Pro Ala His
100 105 110

Leu Ala Arg His Leu His Ala Ala Ile Leu Gly Leu Thr Gly Pro Ala
115 120 125

Glu Thr Pro Val Thr Ala Ala Val Gly Ser Asp Glu Pro Ile Ala Ile
130 135 140

Val Gly Ile Gly Cys His Phe Pro Gly Gly Val Gln Ser Pro Glu Ala
145 150 155 160

Leu Trp Asn Leu Val Glu Thr Gly Thr Asp Ala Ile Ser Ala Phe Pro
165 170 175

Thr Gly Arg Gly Trp Asp Leu Asp Ala Leu Tyr Asp Pro Asp Pro Asp
180 185 190

Arg Ala Gly Thr Ser Tyr Ala Arg Glu Gly Gly Phe Leu His Asp Ala
195 200 205

Asp Ala Phe Asp Ala Ala Phe Phe Gly Ile Ser Pro Arg Glu Ala Leu
210 215 220

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Ala Met Asp Pro Gln Gln Arg Leu Leu Leu Glu Ala Ser Trp Glu Ala
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Phe Asp Arg Ala Gly Val Asp Pro Ala Ala Leu Arg Gly Gly Gln Val
                245                 250                 255

Gly Val Phe Val Gly Ala Glu Thr Gln Glu Tyr Gly Pro Arg Leu Gln
            260                 265                 270

Asp Ala Thr Asp Gly Phe Glu Gly Tyr Leu Val Thr Gly Asn Ala Ala
        275                 280                 285

Ser Val Ala Ser Gly Arg Ile Ala Tyr Thr Phe Gly Phe Glu Gly Pro
    290                 295                 300

Thr Val Thr Val Asp Thr Ala Cys Ser Ser Ser Leu Ala Ala Leu His
305                 310                 315                 320

Leu Ala Val Gln Ala Leu Arg Thr Gly Glu Cys Ser Leu Ala Leu Ala
                325                 330                 335

Gly Gly Val Ala Val Met Ala Ser Pro Gly Ser Phe Val Ser Phe Ser
            340                 345                 350

Arg Gln Arg Gly Leu Ala Pro Asp Gly Arg Cys Lys Pro Phe Ala Ala
        355                 360                 365

Ala Ala Asp Gly Thr Ala Trp Gly Glu Gly Val Gly Met Leu Leu Val
    370                 375                 380

Glu Arg Leu Ser Asp Ala Arg Ala Lys Gly His Arg Ile Leu Ala Val
385                 390                 395                 400

Val Arg Gly Ser Ala Ile Asn Gln Asp Gly Ala Ser Asn Gly Leu Thr
                405                 410                 415

Ala Pro Ser Gly Pro Ser Gln Gln Arg Val Ile Arg Gln Ala Leu Ala
            420                 425                 430

Asn Ala Gly Leu Ser Ala Ala Glu Val Asp Val Val Glu Ala His Gly
        435                 440                 445

Thr Gly Thr Arg Leu Gly Asp Pro Ile Glu Ala Gln Ala Leu Leu Ala
    450                 455                 460

Thr Tyr Gly Gln Glu His Thr Asp Asp Arg Pro Leu Trp Leu Gly Ser
465                 470                 475                 480

Leu Lys Ser Asn Ile Gly His Thr Gln Ala Ala Ala Gly Val Ala Gly
                485                 490                 495

Ile Ile Lys Met Ile Met Ala Met Arg His Gly Val Leu Pro Arg Thr
            500                 505                 510

Leu His Val Asp Ala Pro Thr Pro His Val Asp Trp Glu Ala Gly Ala
        515                 520                 525

Val Thr Leu Leu Thr Glu Ala Val Glu Trp Pro Glu Ser Asp Arg Pro
    530                 535                 540

Arg Arg Ala Gly Val Ser Ser Phe Gly Met Ser Gly Thr Asn Ala His
545                 550                 555                 560
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Val Ile Val Glu Glu Pro Ala Ala Gln Asp Arg Glu Gly Ala Pro Thr
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Ser Gly Ala Gln Ala Pro Asp Ser Ser Gln Gly Gln Ala Gln Gly Thr
580 585 590

Ser Thr Ala Pro Val Leu Leu Pro Trp Ala Leu Ser Ala Lys Thr Pro
595 600 605

Glu Ala Leu Arg Ala Gln Ala Arg Arg Leu Gly Thr Leu Ile Ala Ala
610 615 620

Gln Pro His Val Thr Pro Leu Asp Ile Gly His Ser Leu Ala Thr Thr
625 630 635 640

Arg Gly Arg Phe Glu Gln Arg Ala Ile Val Leu Gly Asp Asp Arg Glu
645 650 655

Ala Phe Leu Asp Ala Leu His Ala Leu Ala Glu Gly Asn Asp Thr Pro
660 665 670

Ser Val Val Gln Gly Ala Ala Ala Pro Gly Lys Leu Ala Phe Leu Phe
675 680 685

Thr Gly Gln Gly Ser Gln Arg Leu Gly Met Gly Arg Glu Leu Tyr Glu
690 695 700

Thr His Pro Val Phe Ala Asp Ala Leu Asp Asp Ala Cys Trp Tyr Leu
705 710 715 720

Asp Asp Gln Leu Glu Leu Pro Leu Leu Asp Val Leu Phe Ala Asp Glu
725 730 735

Gly Ser Pro Glu Ala Ala Leu Leu His Gln Thr Ala Tyr Thr Gln Pro
740 745 750

Ala Leu Phe Ala Val Glu Val Ala Leu Phe Arg Leu Val Asp Ser Trp
755 760 765

Gly Leu Lys Pro Asp Phe Val Ala Gly His Ser Ile Gly Glu Ile Ala
770 775 780

Ala Ala His Val Ala Gly Val Phe Ser Leu Glu Asp Ala Cys Met Leu
785 790 795 800

Val Ala Ala Arg Gly Arg Leu Met Gln Ala Leu Pro Ala Gly Gly Val
805 810 815

Met Ile Ala Leu Gln Ala Ser Glu Asp Glu Val Leu Pro Leu Leu Thr
820 825 830

Asp Arg Val Ser Ile Ala Ala Ile Asn Gly Pro Gln Ala Val Val Ile
835 840 845

Ala Gly Asp Glu Asp Ala Ala Ala Ala Ile Ala Glu Thr Phe Gln Ala
850 855 860

Ala Gly Arg Lys Thr Lys Arg Leu Thr Val Ser His Ala Phe His Ser
865 870 875 880

Pro His Met Asp Ala Met Leu Glu Glu Phe Leu Arg Val Ala Gln Val
885 890 895

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Leu Asp Tyr Ala Lys Pro Thr Leu Pro Val Val Ser Leu Leu Thr Gly
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Thr Thr Ala Thr Pro Ala Glu Leu Ala Thr Pro Ala Tyr Trp Val Arg
        915                 920                 925

His Val Arg Asp Ala Val Arg Tyr Leu Asp Gly Val Arg Thr Leu His
    930                 935                 940

Gln Arg Gly Val Arg Thr Phe Leu Glu Leu Gly Pro Asp Ala Val Leu
945                 950                 955                 960

Thr Ala Met Ala Gln Asp Cys Val Asp Pro Gln Gly Ala Ala Phe Ala
                965                 970                 975

Pro Ala Leu Arg Ser Gly Arg Pro Glu Ala Ala Thr Val Leu Asn Ala
            980                 985                 990

Val Ala His Ala His Val Arg Gly  Ala Glu Thr Asp Trp  Ala Ala Phe
        995                 1000                1005

Phe Ala  Gly Thr Gly Ala Gln  Arg Val Asp Leu Pro  Thr Tyr Ala
    1010                1015                1020

Phe Gln  Arg Gln Arg Tyr Trp  Met Asp Ser Arg Thr  Pro Ala Pro
    1025                1030                1035

Asp Ser  Ala Ala Gln Arg Ala  His Gly Gly Ala Asp  Pro Val Asp
    1040                1045                1050

Arg Val  Phe Trp Asp Ala Val  Glu His Glu Asp Val  Ala Thr Leu
    1055                1060                1065

Ala Ala  Ala Leu Glu Leu Asp  Leu Asp Gly Glu Gln  Pro Leu Ser
    1070                1075                1080

Glu Val  Val Pro Ala Leu Ser  Ala Trp Arg Arg Arg  Arg Arg Thr
    1085                1090                1095

Gln Ser  Glu Val Asp Gly Trp  Arg Tyr Arg Val Thr  Trp Lys Pro
    1100                1105                1110

Leu Thr  Glu Val Ser Thr Ser  Gly Leu Ser Gly Ser  Trp Val Val
    1115                1120                1125

Ile Ser  Pro Ala Gly Gly Ala  Asp Asp Ser Ala Val  Val Ser Ala
    1130                1135                1140

Leu Val  Gly Arg Gly Val Asp  Val Arg Arg Val Val  Val Glu Ala
    1145                1150                1155

Gly Val  Asp Arg Ser Ala Leu  Ala Gly Leu Leu Ala  Glu Val Gly
    1160                1165                1170

Ser Pro  Ser Gly Val Val Ser  Leu Leu Gly Leu Asp  Glu Ser Gly
    1175                1180                1185

Gly Leu  Leu Gly Thr Val Gly  Leu Val Gln Ala Leu  Gly Asp Ala
    1190                1195                1200

Gly Val  Gly Ala Pro Leu Trp  Cys Leu Thr Arg Gly  Ala Val Ser
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Trp Gly Leu Gly Arg Val Ala Ala Leu Glu Val Pro Glu Trp Trp
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Gly Gly Leu Ile Asp Leu Pro Glu Val Leu Asp Glu Arg Ala Val
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Ser Arg Leu Val Gly Val Leu Ala Gly Ser Gly Glu Asp Gln Val
1265 1270 1275

Ala Val Arg Ser Ser Gly Val Phe Gly Arg Arg Leu Val Arg Ala
1280 1285 1290

Pro Arg Ala Glu Gly Ala Ser Ala Trp Ser Pro Thr Gly Thr Val
1295 1300 1305

Leu Val Thr Gly Gly Thr Gly Val Leu Gly Gly Arg Val Ala Arg
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Trp Leu Ala Gly Ala Gly Ala Glu Arg Leu Val Leu Thr Ser Arg
1325 1330 1335

Arg Gly Leu Asp Ala Pro Gly Ala Val Glu Leu Val Glu Glu Leu
1340 1345 1350

Thr Thr Gly Phe Gly Val Glu Val Ser Val Val Ala Cys Asp Ala
1355 1360 1365

Ala Asp Arg Asp Ala Leu Arg Ala Leu Leu Ser Ala Glu Ala Gly
1370 1375 1380

Ser Leu Thr Ala Val Val His Thr Ala Gly Val Leu Asp Asp Gly
1385 1390 1395

Val Leu Asp Ala Leu Thr Pro Asp Arg Ile Asp Ser Val Val Arg
1400 1405 1410

Ala Lys Ala Val Ser Ala Leu Asn Leu His Glu Leu Thr Ala Glu
1415 1420 1425

Leu Gly Ile Glu Leu Ser Asp Phe Val Leu Phe Ser Ser Val Thr
1430 1435 1440

Gly Thr Val Gly Ala Ala Gly Gln Ala Asn Tyr Ala Ala Ala Asn
1445 1450 1455

Ala Phe Leu Asp Ala Leu Ala Glu Gln Arg Arg Ala Asp Gly Leu
1460 1465 1470

Ala Ala Thr Ser Ile Ala Trp Gly Pro Trp Ala Glu Gly Gly Met
1475 1480 1485

Ala Ala Asp Glu Ala Met Asp Ala Arg Met Arg Arg Glu Gly Met
1490 1495 1500

Pro Pro Met Ala Pro Thr Ser Ala Met Ser Ala Leu Glu Gln Ala
1505 1510 1515

Val Gly Ala Gly Glu Thr Ala Leu Thr Val Ala Asp Ile Asp Trp
1520 1525 1530

Glu Arg Phe Ser Ser Val Ile Ala Ala Val Arg Pro Asn Pro Leu
1535 1540 1545

Ile Gly Asp Phe Val Val Gly Ala Glu Gly Thr Ala Ala Ala Ser
1550 1555 1560

Gly His Gly Ser Val Val Thr Gly Ala Asp Val Ala Ala Thr Val
1565 1570 1575

Ser Gly Arg Leu Ala Gly Leu Thr Gln Ala Glu Gln Glu Arg Glu
1580 1585 1590

Leu Leu Ser Leu Val Arg Leu His Val Ala Ala Val Leu Gly His
1595 1600 1605

Asp Gly Ser Asp Ala Val Gly Ala Glu Arg Ala Phe Lys Glu Leu
1610 1615 1620

Gly Phe Asp Ser Leu Thr Ser Val Glu Leu Arg Asn Arg Leu Gly
1625 1630 1635

Ala Ala Thr Asp Leu Arg Leu Pro Thr Thr Leu Val Tyr Asp Tyr
1640 1645 1650

Pro Thr Ser Ala Ala Leu Ala Glu Tyr Leu Arg Gly Glu Leu Ala
1655 1660 1665

Gly Ser Ala Gln Asp Ala Gly Pro Pro Leu Pro Ala Val Val Gly
1670 1675 1680

Ser Ala Ala Asp Asp Asp Pro Ile Val Ile Val Ser Met Ser Cys
1685 1690 1695

Arg Phe Pro Gly Gly Val Arg Thr Pro Glu Asp Leu Trp Gln Leu
1700 1705 1710

Leu Ala Asp Gly Thr Asp Thr Val Ala Ala Phe Pro Ala Asp Arg
1715 1720 1725

Gly Trp Asp Leu Asp Gly Leu Tyr Ser Ala Asp Pro Glu Arg Ser
1730 1735 1740

Gly Thr Ser Tyr Thr Arg Glu Gly Gly Phe Leu Tyr Asp Ala Ala
1745 1750 1755

Asp Phe Asp Ala Asp Phe Phe Gly Ile Ser Pro Arg Glu Ala Leu
1760 1765 1770

Ala Met Asp Pro Gln Gln Arg Leu Leu Leu Glu Thr Ala Trp Glu
1775 1780 1785

Thr Phe Glu Arg Ala Gly Ile Asp Pro Ala Ser Leu Arg Gly Ser
1790 1795 1800

Gln Ala Gly Val Phe Val Gly Thr Asn Gly Gln Asp Tyr Leu Ser
1805 1810 1815

Leu Val Thr Arg Glu Gly Asp Gly Leu Asp Gly Leu Glu Gly His
1820 1825 1830

Val Gly Thr Gly Asn Ala Ala Ser Val Val Ser Gly Arg Leu Ser
1835 1840 1845

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Tyr Val  Phe Gly Leu Glu Gly  Pro Ala Ile Thr Val  Asp Thr Ala
     1850                1855                1860

Cys Ser  Ser Ser Leu Val Ala  Leu His Leu Ala Val  Gln Ala Leu
     1865                1870                1875

Arg Gln  Gly Glu Cys Thr Leu  Ala Leu Ala Gly Gly  Val Thr Val
     1880                1885                1890

Met Ser  Thr Pro Asp Ala Phe  Val Asp Phe Ser Arg  Gln Arg Gly
     1895                1900                1905

Leu Ala  Glu Asp Gly Arg Ile  Lys Ala Phe Ala Ser  Ala Ala Asp
     1910                1915                1920

Gly Thr  Gly Trp Gly Glu Gly  Val Gly Met Leu Leu  Val Glu Arg
     1925                1930                1935

Leu Ser  Asp Ala Arg Arg Asn  Gly His Pro Val Leu  Ala Val Val
     1940                1945                1950

Arg Gly  Ser Ala Ile Asn Gln  Asp Gly Ala Ser Asn  Gly Leu Thr
     1955                1960                1965

Ala Pro  Asn Gly Pro Ser Gln  Gln Arg Val Ile Arg  Gln Ala Leu
     1970                1975                1980

Ala Gly  Ala Gly Leu Ser Ala  Ala Asp Val Asp Ala  Val Glu Ala
     1985                1990                1995

His Gly  Thr Gly Thr Arg Leu  Gly Asp Pro Ile Glu  Ala Gln Ala
     2000                2005                2010

Leu Leu  Ala Thr Tyr Gly Gln  Gly Arg Pro Ala Asp  Arg Pro Leu
     2015                2020                2025

Trp Leu  Gly Ser Val Lys Ser  Asn Ile Gly His Thr  Gln Ala Ala
     2030                2035                2040

Ala Gly  Val Ala Gly Val Met  Lys Met Val Met Ala  Met Arg His
     2045                2050                2055

Gly Val  Leu Pro Arg Thr Leu  His Val Asp Gly Pro  Thr Pro His
     2060                2065                2070

Val Asp  Trp Ser Ala Gly Asp  Val Ala Leu Leu Thr  Glu Gln Arg
     2075                2080                2085

Glu Trp  Pro Ala Thr Gly His  Pro Arg Arg Ala Gly  Val Ser Ser
     2090                2095                2100

Phe Gly  Leu Ser Gly Thr Asn  Ala His Thr Ile Ile  Glu Glu Ala
     2105                2110                2115

Pro Ala  Asp Asp Asp Ala Glu  Pro Thr Thr Gly Ala  Gly Thr Ala
     2120                2125                2130

Pro Ser  Val Leu Pro Leu Leu  Ile Ser Ala Lys Ser  Asp Ala Gly
     2135                2140                2145

Leu Arg  Ala Gln Ser Glu Gln  Leu Ala Thr His Leu  Val Gly Asn
     2150                2155                2160
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Pro Asp  Val Pro Ile Gly Asp  Ile Ala Tyr Ser Leu  Thr Thr Gly
    2165                 2170                 2175

Arg Ser  Gly Leu Glu Thr Arg  Ala Ile Leu Val Gly  Asp Ala Asp
    2180                 2185                 2190

Asn Arg  Thr Gly Leu Ala Ala  Ala Leu Arg Ser Leu  Ala Ala Gly
    2195                 2200                 2205

Glu Gln  Ala Pro Gly Leu Val  Gln Gly Thr Val Thr  Glu Gly Gly
    2210                 2215                 2220

Leu Ala  Phe Leu Phe Thr Gly  Gln Gly Ser Gln Arg  Leu Gly Met
    2225                 2230                 2235

Gly Arg  Glu Leu Tyr Glu Thr  Tyr Pro Val Phe Ala  Asp Ala Leu
    2240                 2245                 2250

Asp Ala  Val Cys Ala Arg Met  Asp Leu Glu Val Pro  Leu Arg Asp
    2255                 2260                 2265

Val Leu  Phe Gly Ala Tyr Ala  Gly Leu Leu Asp Glu  Thr Ala Tyr
    2270                 2275                 2280

Thr Gln  Pro Ala Leu Phe Ala  Val Glu Val Ala Leu  Phe Arg Leu
    2285                 2290                 2295

Val Glu  Ser Trp Gly Leu Arg  Pro Asp Phe Val Ala  Gly His Ser
    2300                 2305                 2310

Ile Gly  Glu Ile Ala Ala Ala  His Val Ala Gly Val  Leu Ser Leu
    2315                 2320                 2325

Asp Asp  Ala Cys Ala Leu Val  Glu Ala Arg Gly Arg  Leu Met Gly
    2330                 2335                 2340

Ala Leu  Pro Gly Gly Gly Val  Met Ile Ala Val Gln  Ala Pro Glu
    2345                 2350                 2355

Ala Glu  Val Leu Pro Leu Leu  Thr Glu Arg Val Ser  Ile Ala Ala
    2360                 2365                 2370

Ile Asn  Gly Pro Gln Ser Val  Val Ile Ala Gly Asp  Glu Ala Asp
    2375                 2380                 2385

Ala Val  Ala Ile Val Glu Ser  Phe Thr Gly Arg Lys  Ser Lys Arg
    2390                 2395                 2400

Leu Thr  Val Ser His Ala Phe  His Ser Pro His Met  Asp Gly Met
    2405                 2410                 2415

Leu Glu  Asp Phe Arg Ala Val  Ala Glu Gly Leu Ser  Tyr Glu Ala
    2420                 2425                 2430

Pro Arg  Ile Pro Val Val Ser  Asn Leu Thr Gly Ala  Leu Val Ser
    2435                 2440                 2445

Asp Glu  Met Gly Ser Ala Glu  Phe Trp Val Arg His  Val Arg Glu
    2450                 2455                 2460

Ala Val  Arg Phe Leu Asp Gly  Met Arg Val Leu Glu  Ala Ala Gly
    2465                 2470                 2475
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Val Thr  Thr Tyr Val Glu Leu  Gly Pro Gly Gly Val  Leu Ser Ala
    2480                 2485                 2490

Leu Ala  Gln Glu Cys Val Ser  Gly Asp Gly Ala Ala  Phe Val Pro
    2495                 2500                 2505

Val Leu  Arg Ser Gly Arg Pro  Glu Ala Glu Thr Ala  Val Thr Ala
    2510                 2515                 2520

Leu Ala  Gln Ala His Val Arg  Gly Val Asp Val Asp  Trp Ala Ala
    2525                 2530                 2535

Phe Phe  Ser Gly Thr Gly Val  Gln Arg Val Asp Leu  Pro Thr Tyr
    2540                 2545                 2550

Ala Phe  Gln Arg Gln Arg Phe  Trp Pro Ala Met Thr  Ala Glu Ser
    2555                 2560                 2565

Ala Pro  Val Gly Gly Thr Val  Asp Ala Val Asp Ala  His Phe Trp
    2570                 2575                 2580

Asp Val  Ile Glu Gln Glu Asp  Val Glu Ser Leu Ala  Glu Leu Leu
    2585                 2590                 2595

Gly Leu  Asp Asp Ala Ser Ala  Trp Gly Ser Val Val  Pro Ala Leu
    2600                 2605                 2610

Ser Ala  Trp Arg Arg Gln Gly  Gln Gln Gln Ala Gln  Val Asp Gly
    2615                 2620                 2625

Trp Arg  Tyr Arg Ala Ser Trp  Lys Pro Val Thr Ala  Ala Val Ser
    2630                 2635                 2640

Ser Gly  Val Val Ser Gly Thr  Trp Val Val Ala Val  Pro Ala Gly
    2645                 2650                 2655

Ser Ala  Gly Asp Asp Ala Arg  Val Glu Ala Val Thr  Asn Gly Leu
    2660                 2665                 2670

Ala Gly  Arg Gly Val Asp Val  Arg Arg Val Val Val  Glu Ala Gly
    2675                 2680                 2685

Val Asp  Arg Ala Ala Leu Ala  Gly Leu Leu Ala Gly  Glu Gly Ser
    2690                 2695                 2700

Leu Ala  Gly Val Val Ser Leu  Leu Gly Leu Asp Glu  Ser Gly Gly
    2705                 2710                 2715

Leu Ala  Ala Thr Ala Gly Leu  Val Gln Ala Leu Gly  Asp Ala Gly
    2720                 2725                 2730

Val Ser  Ala Pro Leu Trp Cys  Leu Thr Arg Gly Ala  Val Ser Val
    2735                 2740                 2745

Gly Arg  Ser Asp Arg Leu Val  Ser Pro Val Gln Ala  Gln Val Trp
    2750                 2755                 2760

Gly Leu  Gly Arg Val Ala Ala  Leu Glu Val Pro Glu  Arg Trp Gly
    2765                 2770                 2775

Gly Leu  Val Asp Leu Pro Glu  Val Leu Asp Glu Arg  Ala Val Ser
    2780                 2785                 2790
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Arg Leu Ile Gly Val Leu Ala Gly Ser Gly Glu Asp Gln Val Ala
2795 2800 2805

Val Arg Ser Ser Gly Val Phe Gly Arg Arg Leu Val Arg Ala Pro
2810 2815 2820

Arg Ala Glu Gly Ala Ala Ser Trp Thr Pro Thr Gly Thr Val Leu
2825 2830 2835

Val Thr Gly Gly Thr Gly Val Leu Gly Gly Arg Val Ala Arg Trp
2840 2845 2850

Leu Ala Gly Ala Gly Ala Glu Arg Leu Val Leu Thr Ser Arg Arg
2855 2860 2865

Gly Leu Asp Ala Pro Gly Thr Ala Glu Leu Val Glu Glu Leu Thr
2870 2875 2880

Ser Ser Gly Val Glu Val Ser Val Val Ala Cys Asp Ala Ala Asp
2885 2890 2895

Arg Asp Ala Leu Arg Ala Leu Leu Ser Ser Glu Ala Gly Ser Leu
2900 2905 2910

Thr Ala Val Ile His Thr Ala Gly Val Leu Asp Asp Gly Val Leu
2915 2920 2925

Asp Ala Leu Thr Pro Asp Arg Ile Asp Gly Val Val Arg Ala Lys
2930 2935 2940

Ala Val Ser Ala Leu Asn Leu His Glu Leu Thr Ala Glu Leu Gly
2945 2950 2955

Ile Glu Leu Ser Ala Phe Val Leu Phe Ser Ser Met Ser Gly Thr
2960 2965 2970

Val Gly Thr Ala Gly Gln Ala Asn Tyr Ala Ala Ala Asn Ala Tyr
2975 2980 2985

Leu Asp Ala Leu Ala Glu Gln Arg Arg Ala Asp Gly Leu Ala Ala
2990 2995 3000

Thr Ser Ile Ala Trp Gly Pro Trp Ala Glu Gly Gly Met Ala Ala
3005 3010 3015

Asp Ala Ala Leu Glu Ala Arg Met Arg Arg Asp Gly Val Pro Pro
3020 3025 3030

Met Pro Ala Asp Pro Ala Ile Arg Ala Leu Arg Gln Ala Val Ala
3035 3040 3045

Gly Asp Asp Ala Val Leu Thr Val Ala Asp Val Glu Trp Asp Arg
3050 3055 3060

Phe Leu Pro Gly Phe Val Ala Ala Arg His Ser Glu Leu Phe Ser
3065 3070 3075

Glu Leu Arg Asp Val Arg Asp Ala Arg Ala Ala Gln Asp Arg Ala
3080 3085 3090

Gln Ala Ala Val Ala Ala Asp Arg Pro Asp Ser Leu Ser Gly Arg
3095 3100 3105

Leu Ser Ala Gln Ala Pro Ala Glu Gln Glu Arg Glu Leu Leu Asp
3110 3115 3120

Leu Val Arg Thr Gln Val Ala Ala Val Leu Gly His Ala Gly Val
3125 3130 3135

Glu Asn Val Gly Ala Gly Arg Ala Phe Lys Glu Leu Gly Phe Asp
3140 3145 3150

Ser Leu Met Ala Val Glu Leu Arg Asn Arg Ile Gly Ser Ala Thr
3155 3160 3165

Glu Leu Arg Leu Pro Ala Thr Leu Ile Tyr Asp His Pro Thr Ser
3170 3175 3180

Ala Ala Leu Ala Glu Phe Leu Arg Gly Glu Leu Val Gly Thr Val
3185 3190 3195

Arg Val Ala Asp Lys Val Leu Pro Ala Val Val Ser Ala Asp Glu
3200 3205 3210

Asp Pro Ile Ala Ile Val Ser Met Ser Cys Arg Phe Pro Gly Gly
3215 3220 3225

Val Arg Thr Pro Glu Asp Leu Trp Arg Leu Leu Val Asp Gly Thr
3230 3235 3240

Asp Ala Val Gly Ala Phe Pro Ala Asp Arg Gly Trp Asp Leu Asp
3245 3250 3255

Arg Leu Tyr Ser Pro Asp Pro Asp Gln Pro Gly Thr Ser Tyr Thr
3260 3265 3270

Arg Glu Gly Gly Phe Phe Asp Gly Ala Ala Asp Phe Asp Pro Gly
3275 3280 3285

Phe Phe Gly Ile Ser Pro Arg Glu Ala Leu Ala Met Asp Pro Gln
3290 3295 3300

Gln Arg Leu Leu Leu Glu Thr Ser Trp Glu Ala Ile Glu Arg Ala
3305 3310 3315

Gly Ile Asp Pro Ser Ser Leu Arg Gly Ser Gln Ala Gly Val Phe
3320 3325 3330

Val Gly Thr Asn Gly Gln Asp Tyr Leu Ser Leu Ile Thr Arg Glu
3335 3340 3345

Ser Glu Gly Leu Glu Gly His Leu Gly Thr Gly Asn Ala Gly Ser
3350 3355 3360

Val Met Ser Gly Arg Val Ser Tyr Val Leu Gly Leu Glu Gly Pro
3365 3370 3375

Ala Val Thr Val Asp Thr Ala Cys Ser Ser Ser Leu Val Ala Leu
3380 3385 3390

His Trp Ala Ile Gln Ala Leu Arg Gln Gly Glu Cys Ser Met Ala
3395 3400 3405

Leu Ala Gly Gly Val Thr Val Met Ser Thr Pro Glu Asn Phe Val
3410 3415 3420

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Asp Phe  Ser Arg Gln Arg Gly  Leu Ala Glu Asp Gly  Arg Ile Lys
    3425                 3430                 3435

Ala Phe  Ala Ser Ala Ala Asp  Gly Thr Gly Trp Gly  Glu Gly Val
    3440                 3445                 3450

Gly Met  Leu Leu Val Glu Arg  Leu Ser Asp Ala Arg  Arg Asn Gly
    3455                 3460                 3465

His Pro  Val Leu Ala Val Val  Arg Gly Ser Ala Val  Asn Gln Asp
    3470                 3475                 3480

Gly Ala  Ser Asn Gly Leu Thr  Ala Pro Asn Gly Pro  Ser Gln Gln
    3485                 3490                 3495

Arg Val  Ile Arg Ala Ala Leu  Ala Ser Ala Gly Leu  Ser Ala Ala
    3500                 3505                 3510

Asp Val  Asp Val Val Glu Ala  His Gly Thr Gly Thr  Lys Leu Gly
    3515                 3520                 3525

Asp Pro  Ile Glu Ala Gln Ala  Leu Leu Ala Thr Tyr  Gly Gln Asp
    3530                 3535                 3540

Arg Pro  Ala Gly Arg Pro Leu  Trp Leu Gly Ser Ile  Lys Ser Asn
    3545                 3550                 3555

Ile Gly  His Thr Gln Ala Ala  Ala Gly Val Ala Gly  Ile Ile Lys
    3560                 3565                 3570

Met Val  Leu Ala Met Gln His  Gly Val Leu Pro Gln  Thr Leu His
    3575                 3580                 3585

Val Asp  Glu Pro Thr Pro His  Val Asp Trp Ser Ala  Gly Glu Val
    3590                 3595                 3600

Thr Leu  Leu Thr Glu Gln Thr  Ala Trp Pro Thr Val  Asp Arg Pro
    3605                 3610                 3615

Arg Arg  Ala Gly Val Ser Ser  Phe Gly Ile Ser Gly  Thr Asn Ala
    3620                 3625                 3630

His Thr  Ile Ile Glu Gln Ala  Pro Ala Val Glu Gln  Leu Ala Asp
    3635                 3640                 3645

Gly Asp  Ala Thr Pro Ala Thr  Pro Ala Leu Ala Leu  Pro Leu Pro
    3650                 3655                 3660

Tyr Val  Leu Ser Ala Lys Ser  Pro Glu Ala Leu Arg  Ala Gln Ala
    3665                 3670                 3675

Ser Val  Leu Arg Thr His Leu  Glu Ala Thr Asp His  Asn Gly Pro
    3680                 3685                 3690

Gly Ser  Asp Asp Leu Ala Phe  Ser Leu Ala Thr Ala  Arg Ala His
    3695                 3700                 3705

Leu Glu  His Arg Ala Val Leu  Thr Ala Asp Asp Pro  Gln Glu Phe
    3710                 3715                 3720

Arg Glu  Ala Leu Ala Arg Leu  Ala Asp Gly Asp Pro  Ser Pro Arg
    3725                 3730                 3735
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Ile Thr  Thr Gly Ala Val Ser  Asp Gly Arg Thr Ala  Phe Leu Phe
    3740                 3745                 3750

Thr Gly  Gln Gly Ser Gln Arg  Leu Gly Met Gly Arg  Glu Leu Tyr
    3755                 3760                 3765

Glu Ala  Tyr Pro Val Phe Ala  Asp Ala Leu Asp Ala  Val Cys Ala
    3770                 3775                 3780

His Val  Asp Ala His Leu Glu  Val Pro Leu Lys Asp  Val Leu Phe
    3785                 3790                 3795

Gly Ala  Asp Ala Gly Leu Leu  Asp Gln Thr Ala Tyr  Thr Gln Pro
    3800                 3805                 3810

Ala Leu  Phe Ala Val Glu Val  Ala Leu Phe Arg Leu  Val Glu Ser
    3815                 3820                 3825

Trp Gly  Val Lys Pro Asp Phe  Val Ala Gly His Ser  Ile Gly Glu
    3830                 3835                 3840

Ile Ala  Ala Ala His Val Ala  Gly Val Phe Ser Leu  Gln Asp Ala
    3845                 3850                 3855

Ser Glu  Leu Val Phe Ala Arg  Gly Arg Leu Met Gln  Ala Leu Pro
    3860                 3865                 3870

Thr Gly  Gly Val Met Ile Ala  Val Gln Ala Ser Glu  Asp Glu Val
    3875                 3880                 3885

Leu Pro  Leu Leu Thr Asp Arg  Val Ser Ile Ala Ala  Ile Asn Gly
    3890                 3895                 3900

Pro Gln  Ser Val Val Ile Ala  Gly Asp Glu Ala Asp  Ala Val Ala
    3905                 3910                 3915

Ile Ala  Glu Ser Phe Thr Asp  Arg Lys Ser Lys Arg  Leu Thr Val
    3920                 3925                 3930

Ser His  Ala Phe His Ser Pro  His Met Asp Gly Met  Leu Asp Ala
    3935                 3940                 3945

Phe Arg  Glu Ile Ala Glu Gly  Leu Ser Tyr Glu Pro  Ser Arg Ile
    3950                 3955                 3960

Pro Val  Val Ser Asn Leu Thr  Gly Ala Leu Val Ser  Asp Glu Met
    3965                 3970                 3975

Gly Ser  Ala Glu Phe Trp Val  Arg His Val Arg Glu  Ala Val Arg
    3980                 3985                 3990

Phe Leu  Asp Gly Ile Arg Thr  Leu Glu Ala Ala Gly  Val Thr Lys
    3995                 4000                 4005

Tyr Val  Glu Leu Gly Pro Asp  Gly Val Leu Ser Ala  Met Ala Gln
    4010                 4015                 4020

Asp Cys  Val Ser Gly Glu Gly  Ser Val Phe Ile Pro  Val Leu Arg
    4025                 4030                 4035

Lys Ala  Arg Pro Glu Ala Glu  Ser Val Thr Thr Ala  Leu Ala Ser
    4040                 4045                 4050
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Ala His Val His Gly Ile Pro Val Asp Trp Gln Ala Tyr Phe Ala
4055 4060 4065

Gly Thr Gly Ala Gln Arg Val Asp Leu Pro Thr Tyr Ala Phe Gln
4070 4075 4080

Arg Gln Arg Tyr Trp Pro Ser Ala Ala Ala Phe Val Thr Gly Asp
4085 4090 4095

Pro Thr Ala Ile Gly Leu Gly Asp Ala Gly His Pro Leu Leu Gly
4100 4105 4110

Ala Ala Val Ala Leu Ala Asp Ser Glu Gly Val Leu Phe Thr Gly
4115 4120 4125

Arg Leu Ser Leu Asp Thr His Pro Trp Leu Ala Asp His Thr Ile
4130 4135 4140

Leu Gly Ser Val Leu Leu Pro Gly Thr Ala Phe Val Asp Leu Ala
4145 4150 4155

Ile Arg Ala Gly Asp Gln Val Gly Cys Asp Val Val Glu Glu Leu
4160 4165 4170

Thr Leu Glu Ala Pro Leu Val Val Pro Gln Arg Gly Gly Val Gln
4175 4180 4185

Leu Gln Leu Val Val Glu Ala Pro Ser Gly Pro Gly Gln Arg Pro
4190 4195 4200

Phe Ser Val His Ser Arg Arg Gln Asp Ala Tyr Ala Glu Glu Pro
4205 4210 4215

Trp Met Arg His Ala Ser Gly Val Leu Thr Ser Gly Val Ser Arg
4220 4225 4230

Arg Glu Leu Ser Val Glu Gly Gly Glu Phe Glu Ala Leu Ala Val
4235 4240 4245

Trp Pro Pro Thr Gly Ala Val Pro Val Asp Val Arg Gly Leu Tyr
4250 4255 4260

Glu Glu Leu Ala Glu Ala Gly Val Ala Tyr Gly Pro Leu Phe Gln
4265 4270 4275

Gly Leu Lys Ala Ala Trp Arg Arg Asp Gly Glu Leu Phe Thr Glu
4280 4285 4290

Val Ala Leu Pro Gly Glu Ala Arg Arg Glu Ala Ala Arg Phe Gly
4295 4300 4305

Leu His Pro Ala Leu Leu Asp Ala Gly Leu His Ala Ile Gly His
4310 4315 4320

Gly Glu Gly Pro Glu Pro Ala Met Thr Gly Ala Leu Leu Pro Phe
4325 4330 4335

Ser Trp Ala Gly Val Ser Leu Tyr Ala Ala Gly Ala Ser Ser Leu
4340 4345 4350

Arg Met Arg Leu Thr Pro His Thr Pro Asp Asp Ala His Thr Met
4355 4360 4365

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Ala Leu  Leu Val Ala Asp Glu  Thr Gly Arg Pro Val  Ala Ala Val
    4370                 4375                 4380

Glu Ser  Leu Ile Leu Arg Thr  Ala Ser Ala Asp Gln  Val Arg Ala
    4385                 4390                 4395

Ala Asp  Gly Gly His Leu Asp  Ser Leu Phe Lys Val  Glu Trp Leu
    4400                 4405                 4410

Pro Val  Ala Gly Gly Ala Thr  Pro His Gly Asp Ser  Thr Gly Arg
    4415                 4420                 4425

Arg Trp  Ala Val Leu Gly Arg  Asp Gly Leu Gly Leu  Pro Ala Thr
    4430                 4435                 4440

Gly Val  Gln Gly Gln Val Ala  Glu Tyr Asp Asp Ala  Ser Ala Leu
    4445                 4450                 4455

Gly Ala  Ala Leu Ala Ala Gly  Glu Pro Val Pro Asp  Ala Val Phe
    4460                 4465                 4470

Val His  Pro Gly Ala Leu Pro  Gly Gln Asp Thr Asp  Thr Thr Ala
    4475                 4480                 4485

Ala Ser  Val His Ala Ala Val  Thr Asp Ala Leu Ser  Phe Val Gln
    4490                 4495                 4500

Glu Trp  Leu Ala Asp Glu Arg  Phe Ala Ala Thr Arg  Leu Val Trp
    4505                 4510                 4515

Leu Thr  Ser Gly Ala Val Ala  Asp Glu Pro Gly Ala  Gly Val Arg
    4520                 4525                 4530

Asp Leu  Ala Gly Ser Ala Val  Arg Gly Leu Leu Arg  Ser Ala Gln
    4535                 4540                 4545

Ser Glu  Asn Pro Gly Gln Leu  Leu Met Leu Asp Leu  Asp Gln Asp
    4550                 4555                 4560

Pro Ala  Ser Leu Ala Ala Leu  Pro Ala Ala Leu Ala  Ala Gly Glu
    4565                 4570                 4575

Pro Glu  Leu Ala Ile Arg Arg  Gly Glu Leu Arg Thr  Pro Arg Leu
    4580                 4585                 4590

Thr Arg  Val Pro Ser Ala Asp  Ala Ala Ala Glu Pro  Leu Gly Thr
    4595                 4600                 4605

Leu Gly  Asp Pro Ser Gly Thr  Val Leu Val Thr Gly  Ala Thr Gly
    4610                 4615                 4620

Thr Leu  Gly Gly Leu Phe Ala  Arg His Leu Val Thr  Ala Tyr Gly
    4625                 4630                 4635

Val Arg  Arg Leu Leu Leu Thr  Ser Arg Arg Gly Pro  Glu Ala Glu
    4640                 4645                 4650

Gly Ala  Ala Glu Leu Val Ala  Glu Leu Glu Gln Leu  Gly Ala His
    4655                 4660                 4665

Val Glu  Leu Val Ala Cys Asp  Ala Ala Asp Arg Ser  Ala Leu Ala
    4670                 4675                 4680
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Ala Leu  Leu Gly Ala Val Pro  Ser Glu His Pro Leu  Thr Ala Val
    4685                 4690                 4695

Val His  Thr Ala Gly Val Leu  Asp Asp Gly Ile Leu  Ser Ser Leu
    4700                 4705                 4710

Thr Pro  Glu Arg Val Ala Ala  Val Leu Arg Pro Lys  Val Asp Ala
    4715                 4720                 4725

Ala Trp  Asn Leu His Glu Leu  Thr Arg Glu Leu Gly  Leu Ser Ala
    4730                 4735                 4740

Phe Val  Leu Phe Ser Gly Ala  Ala Ala Ala Phe Gly  Ala Ala Gly
    4745                 4750                 4755

Gln Gly  Asn Tyr Ala Ala Ala  Asn Ser Phe Leu Glu  Ala Leu Ala
    4760                 4765                 4770

Glu Gln  Arg Arg Ala Glu Gly  Leu Pro Ala Thr Ser  Leu Ala Trp
    4775                 4780                 4785

Gly Leu  Trp Ala Pro Gln Thr  Gly Gly Met Ala Gln  Gln Leu Asp
    4790                 4795                 4800

Glu Val  Asp Leu Arg Arg Ile  Ala Arg Asp Gly Val  Gly Gly Leu
    4805                 4810                 4815

Ser Gly  Asp Glu Gly Leu Gly  Leu Phe Asp Thr Ala  Met Thr Val
    4820                 4825                 4830

Asp Ala  Ala Val Leu Leu Pro  Met Arg Leu Asp Leu  Ala Val Ala
    4835                 4840                 4845

Arg Ala  Gln Ala Val Ser Thr  Gly Glu Thr Pro Ala  Leu Leu Arg
    4850                 4855                 4860

Ala Leu  Ile Arg Val Pro Ala  Arg Arg Ala Val Glu  Gln Arg Thr
    4865                 4870                 4875

Ala Ala  Asp Gly Ala Ser Pro  Leu Ala Ala Arg Leu  Ser Ala Leu
    4880                 4885                 4890

Pro Asp  Ala Glu Arg Glu Asp  Met Leu Leu Asp Leu  Val Cys Gly
    4895                 4900                 4905

Arg Val  Ala Glu Val Leu Gly  His Thr Asp Ala Arg  Ala Val Asp
    4910                 4915                 4920

Ala Asp  Arg Ala Phe Lys Glu  Leu Gly Phe Asp Ser  Leu Thr Ala
    4925                 4930                 4935

Val Glu  Leu Arg Asn Val Leu  Lys Ala Ala Thr Gly  Leu Arg Leu
    4940                 4945                 4950

Ser Pro  Thr Leu Val Phe Asp  Tyr Pro Thr Pro Val  Ala Leu Ala
    4955                 4960                 4965

Arg His  Leu Leu Ala Glu Leu  Ala Gly Thr Ala Asp  Asp Gln Asp
    4970                 4975                 4980

Ala Val  Arg Gly Arg Lys Ala  Pro Ala Arg Pro Ala  Thr Ala Ala
    4985                 4990                 4995
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Val Thr  Ser Val Thr Gly Glu  Asp Pro Ile Val Ile  Val Gly Met
    5000                 5005                 5010

Gly Cys  Arg Phe Pro Gly Gly  Val Arg Ser Pro Glu  Asp Leu Trp
    5015                 5020                 5025

Gln Leu  Val Ala Thr Gly Gly  Asp Gly Ile Thr Gly  Phe Pro Ser
    5030                 5035                 5040

Asp Arg  Gly Trp Asn Val Glu  Ala Leu Tyr His Pro  Asp Pro Asp
    5045                 5050                 5055

His Ala  Gly Thr Ser Tyr Thr  Arg Glu Gly Gly Phe  Leu His Asp
    5060                 5065                 5070

Ala Ala  Asp Phe Asp Pro Gly  Phe Phe Gly Ile Ser  Pro Arg Glu
    5075                 5080                 5085

Ala Leu  Ala Met Asp Pro Gln  Gln Arg Leu Leu Leu  Glu Thr Ser
    5090                 5095                 5100

Trp Glu  Ala Phe Glu Arg Ala  Gly Ile Asp Pro Ala  Thr Leu Arg
    5105                 5110                 5115

Gly Ser  Arg Thr Gly Val Phe  Ala Gly Val Met Tyr  His Asp Tyr
    5120                 5125                 5130

Val Thr  Gly Ile Gly Asp Gly  Gly Ser Ala Val Glu  Leu Pro Glu
    5135                 5140                 5145

Gly Val  Glu Gly Tyr Leu Gly  Thr Gly Asn Ala Gly  Ser Ile Ala
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Ser Gly  Arg Ile Ala Tyr Thr  Phe Gly Leu Glu Gly  Pro Ala Val
    5165                 5170                 5175

Thr Val  Asp Thr Ala Cys Ser  Ser Ser Leu Val Ala  Leu His Trp
    5180                 5185                 5190

Ala Ile  Gln Ala Leu Arg Ser  Gly Glu Cys Thr Met  Ala Leu Ala
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Gly Gly  Val Ala Val Met Ala  Thr Pro Glu Thr Phe  Val Asp Phe
    5210                 5215                 5220

Ser Arg  Gln Arg Gly Leu Ser  Ala Asp Gly Arg Cys  Lys Ser Phe
    5225                 5230                 5235

Ala Ala  Ala Ala Asp Gly Thr  Gly Trp Ala Glu Gly  Ala Gly Met
    5240                 5245                 5250

Leu Leu  Val Glu Arg Leu Ser  Asp Ala Glu Arg Asn  Gly His Pro
    5255                 5260                 5265

Val Leu  Ala Val Val Arg Gly  Ser Ala Ile Asn Gln  Asp Gly Ala
    5270                 5275                 5280

Ser Asn  Gly Leu Thr Ala Pro  Asn Gly Pro Ser Gln  Gln Arg Val
    5285                 5290                 5295

Ile Arg  Glu Ala Leu Ala Ser  Ala Asp Leu Ser Ala  Ala Asp Ile
    5300                 5305                 5310
```

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Asp Ala  Val Glu Ala His Gly  Thr Gly Thr Arg Leu  Gly Asp Pro
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Ile Glu  Ala Gln Ala Leu Leu  Ala Thr Tyr Gly Arg  Glu Arg Glu
    5330                 5335                 5340

Ala Gly  Arg Pro Leu Trp Leu  Gly Ser Ile Lys Ser  Asn Ile Gly
    5345                 5350                 5355

His Thr  Gln Ala Ala Ala Gly  Val Ala Gly Ile Ile  Lys Met Val
    5360                 5365                 5370

Met Ala  Met Arg His Gly Val  Leu Pro Gln Thr Leu  His Val Asp
    5375                 5380                 5385

Glu Pro  Ser Pro Gln Val Asp  Trp Glu Ala Gly Glu  Val Ser Leu
    5390                 5395                 5400

Leu Thr  Gly Ala Met Pro Trp  Pro Gln Thr Gly Arg  Pro Arg Arg
    5405                 5410                 5415

Ala Gly  Val Ser Ser Phe Gly  Ile Ser Gly Thr Asn  Ala His Thr
    5420                 5425                 5430

Ile Ile  Glu Gln Pro Pro Thr  Arg Glu Val Thr Pro  Thr Val Pro
    5435                 5440                 5445

Val Ala  Pro Val Val Pro Thr  Val Pro Thr Val Pro  Val Val Pro
    5450                 5455                 5460

Trp Val  Leu Ser Gly Lys Gly  Glu Glu Ala Leu Arg  Ala Gln Ala
    5465                 5470                 5475

Arg Gln  Leu Gln Ser Tyr Val  Leu Arg Ala Pro Glu  Leu Arg Pro
    5480                 5485                 5490

Val Asp  Ile Ala Gly Ser Leu  Ala Val Gly Arg Ala  Ser Phe Glu
    5495                 5500                 5505

Asp Arg  Ala Ala Val Val Ala  Ala Asp Arg Glu Gly  Leu Leu Ala
    5510                 5515                 5520

Ala Leu  Ala Ala Leu Ala Asp  Gly Gly Ser Ala Thr  Gly Ala Val
    5525                 5530                 5535

Glu Gly  Ser Ala Val Gly Gly  Lys Leu Ala Phe Leu  Phe Thr Gly
    5540                 5545                 5550

Gln Gly  Ser Gln Arg Leu Gly  Met Gly Arg Glu Leu  Tyr Glu Ala
    5555                 5560                 5565

Tyr Pro  Val Phe Ala Glu Ala  Leu Asp Ala Val Cys  Ala Arg Leu
    5570                 5575                 5580

Glu Leu  Pro Leu Lys Asp Val  Leu Phe Gly Ala Asp  Ala Gly Leu
    5585                 5590                 5595

Leu Asp  Glu Thr Ala Tyr Thr  Gln Pro Ala Leu Phe  Ala Val Glu
    5600                 5605                 5610

Val Ala  Leu Phe Arg Leu Val  Glu Ser Trp Gly Leu  Arg Pro Asp
    5615                 5620                 5625
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Phe Val Ala Gly His Ser Ile Gly Glu Ile Ala Ala Ala His Val
5630 5635 5640

Ala Gly Val Phe Ser Leu Asp Asp Ala Cys Ala Leu Val Glu Ala
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Arg Gly Arg Leu Met Gly Ala Leu Pro Ala Gly Gly Val Met Ile
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Ala Val Gln Ala Ser Glu Asp Glu Val Leu Pro Leu Leu Thr Asp
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Arg Val Ser Ile Ala Ala Ile Asn Gly Pro Arg Ser Val Val Ile
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Ala Gly Asp Glu Ala Asp Ala Val Ala Ile Val Glu Ser Phe Thr
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Gly Arg Lys Ser Lys Arg Leu Thr Val Ser His Ala Phe His Ser
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Pro His Met Asp Gly Met Leu Glu Asp Phe Arg Ala Val Ala Glu
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Gly Leu Ser Tyr Glu Ala Pro Arg Ile Pro Val Val Ser Asn Leu
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Thr Gly Thr Leu Val Thr Asp Glu Met Gly Ser Ala Glu Phe Trp
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Val Arg His Val Arg Glu Ala Val Arg Phe Leu Asp Gly Ile Arg
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Ala Leu Glu Ala Ala Gly Val Thr Thr Tyr Val Glu Leu Gly Pro
5795 5800 5805

Gly Gly Val Leu Ser Ala Leu Ala Gln Glu Cys Val Ser Gly Asp
5810 5815 5820

Gly Ala Ala Phe Val Pro Val Leu Arg Ser Gly Arg Ser Glu Ala
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Glu Thr Ala Val Thr Ala Leu Ala Gln Ala His Val Arg Gly Val
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Asn Val Asp Trp Ala Ala Phe Phe Ala Gly Thr Gly Ala Glu Arg
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Val Asp Leu Pro Thr Tyr Ala Phe Gln Arg Gln Arg Tyr Trp Leu
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His Ile Pro Arg Val Ala Gln Ser Gly Val Ala Asp Glu Val Asp
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Ala Arg Phe Trp Asp Ala Val Glu Arg Glu Asp Leu Glu Ser Leu
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Ala Ser Thr Leu Glu Val Asp Asp Glu Ser Ala Trp Ser Ser Val
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Leu Pro Ala Leu Ser Ala Trp Arg Arg Glu Arg Arg Ala Gln Ser
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Glu Val Asp Gly Trp Arg Tyr Arg Val Ser Trp Lys Pro Leu Ala
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Glu Val Ser Ala Ser Gly Leu Ser Gly Ser Trp Val Val Ile Ser
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Pro Ala Gly Ser Val Asp Asp Ser Ala Val Val Ser Ala Leu Val
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Gly Arg Gly Ala Glu Val Arg Arg Val Val Val Glu Ala Gly Val
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Asp Arg Ser Ala Leu Ala Gly Leu Leu Ala Asp Ala Gly Ser Ala
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Glu Ala Pro Leu Trp Cys Leu Thr Arg Gly Ala Val Ser Val Gly
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Arg Ser Asp Arg Leu Val Ser Pro Val Gln Ala Gln Val Trp Gly
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Ala Glu Gly Ala Ser Ala Trp Thr Pro Thr Gly Thr Val Leu Val
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Thr Gly Gly Thr Gly Val Leu Gly Gly Arg Val Ala Arg Trp Leu
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Pro Asp Ala Pro Gly Ala Ala Glu Leu Val Glu Glu Leu Thr Thr
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Gly Phe Gly Val Glu Val Ser Val Val Ala Cys Asp Ala Ala Asp
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Asp Ala Leu Thr Pro Asp Arg Ile Asp Ser Val Leu Arg Ala Lys
6245 6250 6255

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Ala Val  Ser Ala Phe Asn Leu  His Glu Leu Thr Ala  Glu Leu Gly
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Ile Glu  Leu Ser Ala Phe Val  Leu Phe Ser Ser Met  Ser Gly Thr
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Val Gly  Ala Ala Gly Gln Ala  Asn Tyr Ala Ala Ala  Asn Ala Tyr
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Leu Asp  Ala Leu Ala Glu Gln  Arg Arg Ala Asp Gly  Leu Ala Ala
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Thr Ser  Leu Ala Trp Gly Pro  Trp Ala Glu Gly Gly  Met Ala Gly
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Asp Asp  Ala Met Asp Ala Arg  Met Arg Arg Glu Gly  Leu Pro Pro
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Met Ala  Pro Asp Ala Ala Leu  Thr Leu Leu Arg Gln  Ser Val Gly
    6350                 6355                 6360

Ser Ala  Asp Ala Ala Leu Met  Val Val Asp Val Glu  Trp Gln Arg
    6365                 6370                 6375

Phe Ala  Pro Ala Leu Thr Val  Val Arg Pro Ser Asn  Leu Leu Ala
    6380                 6385                 6390

Glu Leu  Pro Glu Ala Arg Pro  Ala Gly Thr Asp Ser  Arg Thr Gly
    6395                 6400                 6405

Gly Ala  Thr Ser Ser Glu Gly  Ala Gly Ser Phe Ala  Glu Arg Leu
    6410                 6415                 6420

Ala Ala  Leu Gly Gly Ala Glu  Gln Asp Lys Glu Leu  Leu Asn Leu
    6425                 6430                 6435

Val Arg  Thr His Ile Ala Ala  Val Leu Gly His Gly  Gly Ser Glu
    6440                 6445                 6450

Ala Val  Gly Ala Glu Arg Ala  Phe Lys Glu Leu Gly  Phe Asp Ser
    6455                 6460                 6465

Leu Thr  Ala Val Glu Leu Arg  Asn Arg Leu Gly Ala  Ala Thr Gly
    6470                 6475                 6480

Val Arg  Leu Pro Ala Thr Leu  Ile Phe Asp Tyr Pro  Thr Ala Thr
    6485                 6490                 6495

Ala Leu  Ala Ala Tyr Leu Arg  Gly Glu Leu Leu Gly  Thr Gln Val
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Val Val  Ser Gly Pro Val Ser  Asn Gly Val Val Val  Asp Asp Asp
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Pro Ile  Ala Ile Val Ala Met  Ser Cys Arg Phe Pro  Gly Gly Val
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Arg Thr  Pro Glu Asp Leu Trp  Arg Leu Leu Ser Thr  Gly Gly Asp
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Ala Ile  Gly Glu Phe Pro Ala  Asp Arg Gly Trp Asp  Leu Ser Arg
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Arg Leu Leu Leu Glu Thr Ser Trp Glu Ala Phe Glu Arg Ala Gly
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Asp Gly Ile Glu Gly Phe Leu Gly Thr Gly Asn Ala Ala Ser Val
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Trp Ala Val Gln Ala Leu Arg Ser Gly Glu Cys Ser Leu Ala Leu
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Ala Gly Gly Val Thr Val Met Ser Ser Pro Gly Ala Tyr Ile Asp
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Phe Ser Arg Gln Arg Gly Leu Ala Glu Asp Gly Arg Ile Lys Ala
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Phe Ala Ala Ala Ala Asp Gly Thr Gly Trp Gly Glu Gly Val Gly
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Met Leu Leu Val Glu Arg Leu Ser Asp Ala Arg Arg Asn Gly His
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Pro Val Leu Ala Leu Val Arg Gly Ser Ala Ile Asn Gln Asp Gly
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Ala Ser Asn Gly Leu Thr Ala Pro Asn Gly Pro Ser Gln Gln Arg
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Gly His Thr Gln Ala Ala Ala Gly Val Ala Gly Val Ile Lys Met
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Leu Leu Gln Pro Val Asp Val Ala Tyr Ser Leu Ala Thr Ser Arg
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Met Ser Gly Thr Glu Ala Glu Gly Val Val Leu Asn Leu Val Arg
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<400> 23

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20 25 30

Asp Ala Gln Glu Pro Ile Ala Ile Val Ala Met Ser Cys Arg Phe Pro
35 40 45

Asn Gly Val Gly Ser Pro Glu Asp Leu Trp Arg Leu Val Asp Glu Gly
50 55 60

Gly Asp Ala Ile Thr Gly Phe Pro Ala Asp Arg Gly Trp Asp Ile Glu
65 70 75 80

Ser Leu Ala Asp Pro Asp Pro Asp Arg Lys Gly Thr Phe Tyr Asn Thr
85 90 95

Gly Gly Gly Phe Leu Asp Gly Ala Thr Ala Phe Asp Pro Gly Phe Phe
100 105 110

Gly Ile Ser Pro Arg Glu Ala Leu Ala Met Asp Pro Gln Gln Arg Gln
115 120 125

Leu Leu Glu Thr Ser Trp Glu Val Phe Glu Arg Ala Gly Ile Asp Pro
130 135 140

Ala Ala Val Arg Gly Ser Arg Thr Gly Val Tyr Val Gly Ala Gly Ala
145 150 155 160

Met Gly Tyr Gly Ala Asp Leu Lys Glu Ala Pro Glu Gly Leu Glu Gly
165 170 175

Leu Leu Leu Thr Gly Gly Ala Thr Ser Val Leu Ser Gly Arg Val Ser
180 185 190

Tyr Val Phe Gly Leu Glu Gly Pro Ala Ala Thr Val Asp Thr Ala Cys
195 200 205

Ser Ser Ser Leu Val Ala Leu His Leu Ala Thr Gln Ala Leu Arg Gln
210 215 220

Arg Glu Cys Ser Leu Ala Leu Val Gly Gly Val Cys Val Met Pro Ser
225 230 235 240

Pro Asp Val Phe Val Glu Phe Ser Arg Gln Arg Gly Leu Ser Pro Asp
245 250 255

Gly Arg Cys Lys Ser Phe Ala Ala Ser Ala Asp Gly Thr Gly Trp Ser
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Glu Gly Val Gly Val Leu Leu Val Glu Arg Leu Ser Asp Ala Arg Arg
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Asn Gly His Pro Val Leu Ala Val Val Arg Gly Ser Ala Val Asn Gln
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Asp Gly Ala Ser Asn Gly Leu Thr Ala Pro Asn Gly Pro Ala Gln Gln
305                 310                 315                 320

Arg Val Ile Arg Gln Ala Leu Glu Asn Ala Arg Leu Ser Ala Ala Glu
                325                 330                 335

Val Asp Val Val Glu Ala His Gly Thr Gly Thr Thr Leu Gly Asp Pro
            340                 345                 350

Ile Glu Ala Gln Ala Leu Leu Ala Thr Tyr Gly Gln Asp Arg Pro Glu
        355                 360                 365

Gly Arg Pro Leu Arg Leu Gly Ser Leu Lys Ser Asn Ile Gly His Thr
    370                 375                 380

Gln Ala Ala Ala Gly Val Ala Gly Ile Ile Lys Met Val Met Ala Met
385                 390                 395                 400

Arg His Gly Val Leu Pro Gln Thr Leu His Val Asp Glu Pro Thr Pro
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Asn Val Asp Trp Thr Ala Gly Ala Val Ser Leu Leu Thr Glu Pro Met
            420                 425                 430

Pro Trp Pro Glu Thr Gly Ala Pro Arg Arg Ala Ala Val Ser Ala Phe
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Gly Val Ser Gly Thr Asn Ala His Thr Ile Ile Glu Gln Ala Pro Glu
    450                 455                 460

Pro Asp Ala Glu Ser Val Ser Val Ser Gly Ser Ala Pro Ala Ala Ala
465                 470                 475                 480

Pro Ala Val Pro Thr Pro Val Pro Thr Leu Val Pro Ala Val Leu Pro
                485                 490                 495

Trp Thr Leu Ser Gly Arg Ser Thr Ala Ala Leu Arg Ala Gln Ala Ala
            500                 505                 510

Arg Leu Leu Thr Thr Gln Gly Gln Asp Gly Ala Thr Glu Pro Gly Arg
        515                 520                 525

Pro Leu Asp Ile Gly Tyr Ser Leu Ala Thr Thr Arg Ala Ala Leu Glu
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His Arg Ala Val Leu Leu Gly Arg Thr Glu Asp Asp Phe Ala Ala Ala
545                 550                 555                 560

Leu Ser Ala Leu Ala Glu Gly Ala Glu Ser Ala Gly Leu Val Gln Gly
                565                 570                 575

Arg Val Thr Glu Gly Gly Leu Ala Phe Leu Phe Thr Gly Gln Gly Ser
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Gln Arg Leu Gly Met Gly Arg Glu Leu Tyr Glu Ala Tyr Pro Val Phe
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Asp Val Leu Phe Gly Ala Asp Ala Gly Leu Leu Asp Glu Thr Ala Tyr
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Thr Gln Pro Ala Leu Phe Ala Val Glu Val Ala Leu Phe Arg Leu Val
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Glu Ser Trp Gly Val Lys Pro Asp Phe Val Ala Gly His Ser Ile Gly
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Glu Ile Ala Ala Ala His Val Ala Gly Val Phe Ser Leu Glu Asp Ala
        675                 680                 685

Cys Ala Leu Val Ser Ala Arg Gly Arg Leu Met Gly Ala Leu Pro Ala
    690                 695                 700

Gly Gly Val Met Ile Ala Val Gln Ala Ser Glu Ala Glu Val Leu Pro
705                 710                 715                 720

Leu Leu Thr Asp Arg Val Ser Ile Ala Ala Ile Asn Gly Pro Gln Ser
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Val Val Ile Ala Gly Asp Glu Ala Asp Ala Val Ala Ile Ala Gly Ser
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Phe Ala Asp Arg Lys Ser Lys Arg Leu Thr Val Ser His Ala Phe His
        755                 760                 765

Ser Pro His Met Asp Gly Met Leu Glu Asp Phe Arg Leu Val Ala Glu
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Gly Leu Ser Tyr Glu Ala Pro Arg Ile Pro Val Val Ser Asn Leu Thr
785                 790                 795                 800

Gly Ala Leu Val Ser Asp Glu Met Gly Ser Ala Glu Phe Trp Val Arg
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His Val Arg Glu Ala Val Arg Phe Leu Asp Gly Ile Arg Thr Leu Glu
            820                 825                 830

Ala Ala Gly Val Thr Lys Tyr Val Glu Leu Gly Pro Asp Gly Val Leu
        835                 840                 845

Ser Ala Met Ala Gln Asp Cys Val Ser Gly Glu Gly Ser Val Phe Ile
    850                 855                 860

Pro Val Leu Arg Lys Ala Arg Pro Glu Ala Glu Ser Val Thr Thr Ala
865                 870                 875                 880

Leu Ala Thr Ala His Val His Gly Ile Pro Val Asp Trp Gln Ala Phe
                885                 890                 895

Tyr Ala Gly Thr Gly Ala Gln Arg Val Asp Leu Pro Thr Tyr Ala Phe
            900                 905                 910

Gln His Glu Arg Tyr Trp Leu Glu Pro Ala Thr Gly Gly Ala Gly Asp
        915                 920                 925

Val Ser Gly Ala Gly Leu Asp Pro Ala Gly His Pro Leu Leu Gly Ala
    930                 935                 940
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Ser Leu Arg Thr Gln Pro Trp Leu Ala Asp His Thr Val Ser Gly Thr
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Thr Val Leu Pro Gly Ala Ala Phe Val Glu Leu Ala Val Arg Ala Gly
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Asp Gln Ala Gly Cys Glu Arg Val  Glu Ala Leu Val Leu  Asp Ala Pro
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Leu Ala  Leu Pro Ala Glu Gly  Ala Val Arg Val Gln  Val Leu Val
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Glu Ala  Pro Asp Glu Gln Gly  Arg Arg Pro Phe Thr  Val Ser Ser
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Gln Pro  Glu Thr Ala Pro Ala  Asp Thr Pro Trp Gly  Arg His Ala
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Arg Gly  Val Leu Ala Pro Thr  Ala Pro Ala Pro Ser  Phe Asp Leu
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Leu Tyr  Ala Ser His Asp Thr  Pro Gly Ala His Gly  Pro Glu Arg
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Gly Gly  Leu Phe Arg Ala Val  Glu Ala Val Trp Arg  Cys Asp Gly
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Asp Leu  Phe Ala Glu Val Arg  Leu Pro Glu Gly Gly  Pro Asp Ala
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Gln Ala  Phe Gly Leu His Pro  Ala Leu Leu Asp Ala  Ala Ala His
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Ala Ala  Ser Val Leu Asp Glu  Gln His Gly Thr Gly  Ala Gly Leu
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Gly Thr  Trp Ser Asp Val Thr  Leu His Ala Val Gly  Ala Gly Ala
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Leu Arg  Val Arg Ile Arg Ser  Ala Leu Asp Gly Thr  Val Gly Leu
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Asp Leu  Ala Asp Asp Leu Gly  Glu Pro Val Ala Thr  Val Gly Gly
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Leu Thr  Pro Arg Pro Phe Ala  Gln Ala Gly Ser Gly  Gly Gln Val
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Val Gln  His Asp Ala Leu Phe  Gln Leu Asp Trp Val  Arg Leu Pro
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Leu Ala  Asp Arg Ser Ser Ala  Pro Thr Gly Glu Trp  Ala Val Leu
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Pro Ala Ala His Pro Leu Thr Ala Val Val His Thr Ala Gly Val
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Leu Asp Asp Gly Val Ile Gly Ser Leu Thr Pro Glu Arg Leu Asp
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Thr Val Leu Arg Pro Lys Ala Asp Ala Ala Leu His Leu His Glu
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Leu Thr Arg Asp Leu Pro Leu Thr Ala Phe Val Leu Phe Ser Ala
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Ile Ala Gly Thr Leu Gly Ser Ala Gly Gln Ala Asn Tyr Ala Ala
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Ala Asn Val Phe Leu Asp Ala Leu Ala Gln His Arg His Asp Gln
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Ser Gly  Met Thr Gly Gly Leu  Asp Glu Ala Gln Leu  Arg Arg Met
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Glu Gln  His Gly Met Gly Thr  Leu Ser Ala Thr Asp  Gly Met Ala
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Leu Phe  Asp Ala Ala Leu Ala  Ala Gly Arg Pro Val  Leu Val Pro
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Ala Arg  Leu His Leu Pro Gly  Leu Arg Asn Ala Ala  Gly Pro Gly
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Pro Val  Ala Pro Val Phe Arg  Ser Leu Leu Gly Ala  Ser Gly Arg
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Arg Ala  Ala Arg Thr Arg Thr  Asp Gly Gly Thr Pro  Leu Ala Glu
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Arg Leu  Thr Arg Leu Ala Gly  Pro Glu Gln Asp Arg  Ala Leu Leu
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Asp Leu  Val Arg Ala Gln Val  Ala Ser Val Leu Gly  His Ala Ser
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Asp Ser  Leu Thr Ala Val Glu  Leu Arg Asn Arg Leu  Gly Ala Ala
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Thr Gly  Leu Arg Leu Pro Thr  Thr Leu Val Phe Asp  His Pro Thr
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Pro Thr  Ala Leu Val Arg His  Leu Arg Thr Asp Leu  Leu Gly Ala
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Ala Pro  Asp Pro Gly Ala Asp  Ala Pro Gly Leu Pro  Ala Arg Val
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Gly Leu  Ala Asp Asp Pro Ile  Ala Ile Val Ala Met  Ser Cys Arg
    1790                 1795                 1800

Tyr Pro  Gly Gly Val Arg Thr  Pro Glu Glu Leu Trp  Arg Leu Val
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Glu Thr  Gly Gly Asp Ala Ile  Ala Gly Leu Pro Gly  Asn Arg Gly
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Trp Asp  Thr Asp Ala Leu His  Ala Asp Glu Asp Gly  Arg Thr Phe
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Ala Gly  Gly Phe Leu Tyr Asp  Ala Asp Ser Phe Asp  Ala Asp Phe
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Phe Gly  Ile Ser Pro Arg Glu  Ala Leu Ala Met Asp  Pro Gln Gln
    1865                 1870                 1875

Arg Leu  Leu Leu Glu Thr Ser  Trp Glu Ala Ile Glu  Arg Ala Gly
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Ile Asp  Pro Ser Ser Leu Arg  Gly Ser Arg Ala Gly  Val Phe Val
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Gly Ala  Ala Tyr Ser Gly Tyr  Asp Ala Gln Leu Glu  Gln Ser Gly
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Val Asp  Gly Val Leu Gly His  Val Met Thr Gly Asn  Ala Gly Ser
     1925                 1930                 1935

Val Met  Ser Gly Arg Val Ser  Tyr Ala Leu Gly Leu  Glu Gly Pro
     1940                 1945                 1950

Ala Val  Thr Val Asp Thr Ala  Cys Ser Ser Ser Leu  Val Ala Leu
     1955                 1960                 1965

His Trp  Ala Ile Gln Ala Leu  Arg Asn Gly Glu Cys  Ser Leu Ala
     1970                 1975                 1980

Leu Ala  Gly Gly Val Thr Val  Met Ser Thr Pro Gly  Thr Phe Ser
     1985                 1990                 1995

Glu Phe  Ser Gln Gln Gly Gly  Leu Ser Pro Asp Gly  Arg Cys Lys
     2000                 2005                 2010

Ala Phe  Ala Ser Ala Ala Asp  Gly Thr Gly Trp Gly  Glu Gly Val
     2015                 2020                 2025

Gly Met  Leu Leu Val Glu Arg  Leu Ser Asp Ala Arg  Arg Asn Gly
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His Pro  Val Leu Ala Val Val  Arg Gly Ser Ala Val  Asn Gln Asp
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Gly Ala  Ser Asn Gly Leu Thr  Ala Pro Asn Gly Pro  Ser Gln Gln
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Arg Val  Ile Arg Ala Ala Leu  Ala Ser Ala Gly Leu  Ser Ala Ala
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Asp Val  Asp Val Val Glu Ala  His Gly Thr Gly Thr  Lys Leu Gly
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Asp Pro  Ile Glu Ala Gln Ala  Leu Leu Ala Thr Tyr  Gly Gln Asp
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Arg Pro  Asp Gly Arg Pro Leu  Trp Leu Gly Ser Ile  Lys Ser Asn
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Ile Gly  His Thr Gln Ala Ala  Ala Gly Val Ala Gly  Ile Ile Lys
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Met Val  Met Ala Met Arg His  Gly Val Leu Pro Arg  Thr Leu His
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Val Asp  Glu Pro Thr Ser His  Val Asp Trp Ser Ala  Gly Glu Val
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Ser Leu  Leu Ser Glu Ser Ala  Glu Trp Pro Leu Thr  Glu Arg Pro
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Arg Arg  Ala Gly Val Ser Ser  Phe Gly Ile Ser Gly  Thr Asn Ala
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Leu Ala Val Val Glu Ala Ala Glu Ser Pro Arg Val Ala Asp Leu
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Ala Tyr Ser Leu Ala Thr Ser Arg Ala Gly Leu Asp His Arg Ala
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Ala Thr Gly Gly Gly Leu Ala Phe Leu Phe Thr Gly Gln Gly Ser
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Gln Arg Leu Gly Met Gly Arg Glu Leu Tyr Glu Thr Tyr Pro Val
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Met Lys Glu Val Leu Phe Gly Ala Asp Ala Asp Leu Leu Asn Glu
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Thr Ala His Thr Gln Pro Ala Leu Phe Ala Val Glu Val Ala Leu
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Asp Gly Met Leu Ala Asp Phe Arg Lys Val Ala Glu Gly Leu Val
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Ser Arg  Gly Val Thr Thr Tyr  Ile Glu Leu Gly Pro  Asp Gly Val
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Leu Ser  Ala Leu Ala Gln Asp  Cys Leu Thr Ala Gly  Thr Gly Thr
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Gly Thr  Ala Ile Phe Ala Pro  Val Leu Arg Ala Ala  Arg Pro Glu
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Ala Glu  Ser Val Thr Thr Ala  Leu Ala Thr Ala His  Val His Gly
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Thr Pro  Val Asp Trp Arg Ala  Tyr Phe Ala Gly Thr  Gly Ala Arg
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Arg Ala  Asp Leu Pro Thr Tyr  Pro Phe Gln Gly Arg  Arg Tyr Trp
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Pro Glu  Ala Ala Ala Pro Ser  Gly Ala Ala Ala Gly  Leu Gly Asp
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Gln Ala  Val Asp Ala Arg Phe  Trp Asp Ala Val Glu  Arg Ala Asp
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Leu Gly  Ser Leu Ile Gly Gly  Pro Glu Ile Asp Gly  Asp Gln Pro
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Leu Ser  Ser Val Leu Pro Ala  Leu Ser Asp Trp Arg  Arg Asn Gln
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Gln Ala  Gln Ser Gln Ala Asp  Ala Arg Leu Tyr Arg  Ile Ala Trp
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Gln Pro  Trp Ser Gly Ala Gly  Arg Gly Thr Pro Ala  Gly Thr Trp
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Ala Gly  Val Leu Ser Leu Leu  Ala Leu Asp Glu Arg  Pro His Pro
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<400> 25

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35 40 45

Gly Val Ser Ser Pro Glu Asp Leu Trp Arg Leu Val Glu Ser Gly Gly
50 55 60

Asp Ala Ile Ser Gly Phe Pro Val Asn Arg Gly Trp Asp Ile Glu Ser
65 70 75 80

Leu Tyr Asp Pro Asp Pro Asp His Glu Gly Thr Thr Tyr Ala Arg Asp
85 90 95

Gly Gly Phe Leu His Glu Ala Ala Asp Phe Asp Pro Ala Phe Phe Gly
100 105 110

Ile Ser Pro Arg Glu Ala Leu Ala Met Asp Pro Gln Gln Arg Leu Leu
115 120 125

Leu Glu Thr Thr Trp Glu Val Phe Glu Arg Ala Gly Ile Asp Pro Ala
130 135 140

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Ser Leu Arg Gly Ser Arg Ala Gly Val Phe Val Gly Ala Ser Ala Asn
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Ala Tyr Gly Ala Gly Ser His Asp Leu Pro Asp Gly Val Glu Gly His
                165                 170                 175

Leu Leu Thr Gly Thr Ala Ser Ser Val Leu Ser Gly Arg Leu Ala Tyr
            180                 185                 190

Val Phe Gly Leu Glu Gly Pro Ala Ala Thr Ile Asp Thr Ala Cys Ser
        195                 200                 205

Ser Ser Ser Val Ala Leu His Met Ala Val Gln Ala Leu Arg Gln Gly
    210                 215                 220

Glu Cys Ser Leu Ala Leu Ala Ala Gly Val Thr Val Leu Ala Gly Pro
225                 230                 235                 240

Asp Val Phe Val Glu Phe Ser Arg Gln Arg Gly Leu Ser Pro Asp Gly
                245                 250                 255

Arg Cys Arg Ser Phe Ala Glu Ser Ala Asp Gly Thr Gly Trp Ser Glu
            260                 265                 270

Gly Ala Gly Val Leu Leu Val Glu Arg Leu Ser Asp Ala Arg Arg Asn
        275                 280                 285

Gly His His Ile Leu Ala Val Val Arg Gly Ser Ala Val Asn Gln Asp
    290                 295                 300

Gly Ala Ser Asn Gly Leu Thr Ala Pro Asn Gly Pro Ala Gln Gln Lys
305                 310                 315                 320

Val Ile Arg Gln Ala Leu Glu Ser Ala Arg Leu Thr Pro Ala Asp Ile
                325                 330                 335

Asp Ala Val Glu Ala His Gly Thr Gly Thr Thr Leu Gly Asp Pro Ile
            340                 345                 350

Glu Ala Gln Ala Leu Leu Ala Thr Tyr Gly Gln Gly Arg Thr Asp Gly
        355                 360                 365

Arg Pro Leu Trp Leu Gly Ser Leu Lys Ser Asn Leu Gly His Thr Gln
    370                 375                 380

Asn Ala Ala Gly Val Ala Gly Ile Ile Lys Met Val Met Ala Met Arg
385                 390                 395                 400

His Gly Val Leu Pro Arg Thr Leu His Val Asp Glu Pro Thr Ser His
                405                 410                 415

Val Asp Trp Ser Thr Gly Ala Val Ala Leu Leu Thr Glu Pro Val Glu
            420                 425                 430

Trp Pro Glu Thr Gly Arg Pro Arg Arg Val Gly Val Ser Ala Phe Gly
        435                 440                 445

Val Ser Gly Thr Asn Val His Thr Ile Ile Glu Gln Ala Pro Ala Pro
    450                 455                 460

Ala Pro Ala Pro Val Ala Asp Asp Thr Ser Glu Pro Ala Pro Ala Ala
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Arg Pro Lys Ala Leu Pro Trp Leu Leu Ser Ala Lys Gly Arg Asp Ala
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Leu Arg Asp Arg Ala Ala Gln Leu Leu Ala Tyr Ala Glu Glu His Pro
500 505 510

Asp Leu Arg Pro Val Asp Ile Ala Gly Ser Leu Ala Val Gly Arg Pro
515 520 525

Ser Phe Glu Asp Arg Ala Ala Val Val Ala Ala Asp Arg Glu Gly Leu
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Leu Ala Gly Leu Ala Ala Leu Ala Asp Gly Gly Ser Ala Thr Gly Leu
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Val Lys Gly Ser Ser Gln Leu Val Gly Lys Leu Ala Phe Leu Phe Thr
565 570 575

Gly Gln Gly Ser Gln Arg Leu Gly Met Gly Arg Glu Leu Tyr Glu Thr
580 585 590

Tyr Pro Val Phe Ala Gln Ala Leu Asp Ala Val Cys Glu Arg Leu Glu
595 600 605

Leu Pro Leu Lys Asn Val Leu Phe Gly Thr Asp Ser Ala Ala Leu Asp
610 615 620

Glu Thr Ser Tyr Thr Gln Pro Ala Leu Phe Ala Val Glu Val Ala Leu
625 630 635 640

Phe Arg Leu Val Glu Ser Trp Gly Leu Lys Pro Asp Phe Leu Ala Gly
645 650 655

His Ser Ile Gly Glu Ile Ala Ala Ala His Val Ala Gly Val Phe Ser
660 665 670

Leu Asp Asp Ala Cys Ala Leu Val Ser Ala Arg Gly Arg Leu Met Gly
675 680 685

Ala Leu Pro Gly Gly Gly Val Met Ile Ala Val Gln Ala Ser Glu Asp
690 695 700

Glu Val Leu Pro Leu Leu Thr Asp Arg Val Ser Ile Ala Ala Ile Asn
705 710 715 720

Gly Pro Gln Ser Val Val Ile Ala Gly Asp Glu Ala Asp Ala Val Ala
725 730 735

Ile Ala Glu Ser Phe Ala Asp Arg Lys Ser Lys Arg Leu Thr Val Ser
740 745 750

His Ala Phe His Ser Pro His Met Asp Gly Met Leu Glu Asp Phe Arg
755 760 765

Val Val Ala Glu Gly Leu Ser Tyr Glu Ala Pro Arg Ile Pro Val Val
770 775 780

Ser Asn Leu Thr Gly Ala Leu Val Ser Asp Glu Met Gly Ser Ala Asp
785 790 795 800

Phe Trp Val Arg His Val Arg Glu Thr Val Arg Phe Leu Asp Gly Ile
805 810 815

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Arg Thr Leu Glu Ala Ala Gly Val Thr Lys Tyr Val Glu Leu Gly Pro
            820                 825                 830

Asp Gly Val Leu Ser Ala Leu Ala Gln Asp Cys Val Ser Gly Glu Asp
        835                 840                 845

Ser Val Phe Ile Pro Val Leu Arg Lys Ala Arg Pro Glu Ala Glu Thr
    850                 855                 860

Val Ala Thr Ala Leu Ala Ser Ala His Val His Gly Ile Pro Val Asp
865                 870                 875                 880

Trp Arg Ala Tyr Phe Ala Gly Thr Gly Ala Gln Arg Val Asp Leu Pro
                885                 890                 895

Thr Tyr Pro Phe Gln Arg Gln Arg Tyr Trp Ile Glu Pro Gly Gly Arg
            900                 905                 910

Ala Gly Asp Val Gly Ala Ala Gly Leu Glu Glu Ala Gly His Pro Leu
        915                 920                 925

Leu Gly Ala Ala Val Pro Leu Ala Asp Ser Glu Gly Phe Leu Phe Thr
    930                 935                 940

Gly Arg Leu Gly Arg Thr Ser His Pro Trp Leu Ala Asp His Ala Val
945                 950                 955                 960

Met Asp Thr Val Leu Leu Pro Gly Thr Ala Phe Val Asp Leu Ala Val
                965                 970                 975

Arg Ala Gly Asp Gln Val Gly Cys Asp Val Val Glu Glu Leu Thr Leu
            980                 985                 990

Glu Ala Pro Leu Val Leu Pro Glu  Arg Gly Ala Val Gln  Ile Gln Met
        995                 1000                1005

His Val  Gly Ala Pro Asp Ala  Asp Gly Thr Gly Arg  Arg Thr Phe
    1010                1015                1020

Thr Leu  Ser Ser Arg Thr Gln  Asp Gly Ala Ala Asp  Glu Pro Trp
    1025                1030                1035

Thr Arg  His Ala Gly Gly Val  Leu Ala His Gly Ala  Ala Gln Pro
    1040                1045                1050

Ala Phe  Ala Pro Val Gln Trp  Pro Pro Ala Gly Ala  Glu Pro Ile
    1055                1060                1065

Pro Thr  Glu Ser Leu Tyr Ala  Asp Leu Ala Glu Val  Gly Met Gly
    1070                1075                1080

Tyr Gly  Pro Ala Phe Arg Gly  Leu Thr Ala Ala Trp  Arg His Gly
    1085                1090                1095

Glu Ser  Val Tyr Val Glu Val  Ala Leu Pro Glu Glu  Thr Ala Ser
    1100                1105                1110

Thr Ala  Arg Asp Phe Gly Leu  His Pro Ala Leu Leu  Asp Ala Ala
    1115                1120                1125

Leu His  Ala Leu Gly Leu Gly  Val Leu Gly Gly Val  Glu Gly Glu
    1130                1135                1140
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Gly Arg  Leu Pro Phe Ala Trp  Ser Gly Val Thr Leu  His Ala Ala
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Gly Ala  Asp Ala Leu Arg Val  His Leu Ala Pro Ala  Gly Ala His
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Gly Val  Arg Leu Glu Ile Ala  Asp Ala Ala Gly Ala  Pro Val Ala
    1175                 1180                 1185

Thr Val  Asp Ser Leu Val Leu  Arg Thr Val Ser Glu  Glu Gln Val
    1190                 1195                 1200

Arg Ala  Ala Arg Thr Ala Tyr  His Glu Ser Val Phe  Arg Ala Glu
    1205                 1210                 1215

Trp Thr  Ala Leu Pro Thr Ala  Ala Glu Ser Ala Ala  Thr His Gly
    1220                 1225                 1230

Arg Trp  Ala Val Leu Gly Ala  Ala Asp Ala Gly Asp  Ser Pro Arg
    1235                 1240                 1245

Asp Ala  Leu Val Asn Gly Leu  Leu Gly His Leu Pro  Gly Glu Val
    1250                 1255                 1260

Ala Arg  Tyr Ala Asp Leu Ala  Glu Leu Ala Ala Ala  Val Glu Ala
    1265                 1270                 1275

Gly Ala  Ala Thr Pro Asp Ala  Val Phe Ala Ala Tyr  Ala Arg Ser
    1280                 1285                 1290

Asp Asp  Asp Gly Pro Ala Ala  Pro Asp Val Ser Ala  Pro Asp Val
    1295                 1300                 1305

Ser Ala  Gln Ala Val His Ala  Ala Thr His Asp Ala  Leu Ala Leu
    1310                 1315                 1320

Val Gln  Thr Trp Phe Gly Glu  Glu Pro Phe Ala Gly  Asp Arg Phe
    1325                 1330                 1335

Ala Ala  Thr Arg Leu Val Val  Leu Thr Arg Gly Ala  Val Ala Ala
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Gly Asp  Gly Asp Thr Val Thr  Asp Pro Ala His Ala  Ala Val Trp
    1355                 1360                 1365

Gly Leu  Leu Arg Ser Ala Gln  Ser Glu Tyr Pro Asp  Arg Leu Leu
    1370                 1375                 1380

Leu Ile  Asp Thr Asp Gly Val  Glu Asp Ser Val His  Ala Leu Pro
    1385                 1390                 1395

Ala Val  Leu Ala Val Gly Glu  Pro Gln Leu Ala Leu  Arg Ala Gly
    1400                 1405                 1410

Ser Val  His Ala Leu Arg Leu  Ala Arg Val Ala Ala  Ala Thr Pro
    1415                 1420                 1425

Glu Asp  Ala Ala Ala Pro Thr  Gln Tyr Ala Pro Gly  Ser Thr Val
    1430                 1435                 1440

Leu Ile  Thr Gly Ala Gly Gly  Met Leu Gly Gly Leu  Ile Ala Arg
    1445                 1450                 1455
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Arg Leu  Val Ala Glu His Gly  Val Arg His Leu Leu  Leu Val Gly
    1460                 1465                 1470

Arg Arg  Gly Ala Ala Ala Pro  Gly Ala Glu Gln Leu  Ser Ala Glu
    1475                 1480                 1485

Leu Ala  Glu Ala Gly Ala Ser  Val Thr Trp Ala Ala  Cys Asp Val
    1490                 1495                 1500

Ala Asp  Arg Asp Ala Leu Ser  Ala Val Leu His Ala  Ile Pro Ala
    1505                 1510                 1515

Glu His  Pro Leu Gly Ala Val  Val His Thr Ala Gly  Val Leu Asp
    1520                 1525                 1530

Asp Gly  Val Ile Ala Ser Leu  Thr Pro Glu Arg Leu  Ser Ala Val
    1535                 1540                 1545

Leu Arg  Pro Lys Val Asp Ala  Ala Cys Asn Leu His  Glu Leu Thr
    1550                 1555                 1560

Arg His  Leu Asp Leu Thr Ala  Phe Val Leu Phe Ser  Ser Ile Gly
    1565                 1570                 1575

Gly Val  Phe Gly Gly Pro Gly  Gln Gly Asn Tyr Ala  Ala Ala Asn
    1580                 1585                 1590

Val Phe  Leu Asp Ala Leu Ala  Gln His Arg Arg Ser  Gln Gly Leu
    1595                 1600                 1605

Ala Ala  Thr Ser Leu Ala Trp  Ala Leu Trp Ala Asp  Ser Thr Gly
    1610                 1615                 1620

Met Ala  Gly Ser Leu Asp Glu  Ala Asp Ile Ser Arg  Met Arg Arg
    1625                 1630                 1635

Gly Gly  Leu Pro Pro Leu Thr  Thr Ala Glu Gly Leu  Glu Leu Phe
    1640                 1645                 1650

Asp Leu  Ala His Arg Ile Asp  Glu Ala Ala Pro Val  Leu Met Arg
    1655                 1660                 1665

Ala Asp  Leu Thr Ala Leu Arg  Thr Gln Ala Gln Ala  Gly Thr Met
    1670                 1675                 1680

Ser Pro  Leu Leu Arg Gly Leu  Val Arg Val Pro Ala  Arg Arg Ser
    1685                 1690                 1695

Ala Ser  Gly Ala Ala Gly Thr  Gly Gly Glu Ser Gly  Leu Arg Glu
    1700                 1705                 1710

Arg Leu  Ala Gly Leu Ser Ala  Ala Glu Arg Asp Arg  Thr Leu Leu
    1715                 1720                 1725

Asp Leu  Val Arg Lys Gln Val  Ala Ala Ala Leu Gly  Tyr Pro Gly
    1730                 1735                 1740

Pro Ser  Ala Val Glu Pro Gly  Arg Ser Phe Lys Glu  Leu Gly Phe
    1745                 1750                 1755

Asp Ser  Leu Thr Ala Val Glu  Leu Arg Asn Leu Leu  Gly Asp Ala
    1760                 1765                 1770
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Thr Gly Arg Arg Leu Pro Ala Thr Leu Val Phe Asp Tyr Pro Thr
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Ala Thr Ala Leu Ala Gly Tyr Leu Arg Glu Glu Ile Ile Gly Asp
1790 1795 1800

Leu Ala Asp Ala Val Thr Ala Pro Ala Leu Val Pro Ser Ala Ala
1805 1810 1815

Val Ala Gly Ala Gly Ala Gly Ala Asp Asp Asp Asp Pro Ile Ala
1820 1825 1830

Ile Val Ala Met Ser Cys Arg Phe Pro Gly Gly Ile Ala Ser Pro
1835 1840 1845

Glu Asp Leu Trp Gln Leu Leu Val Thr Gly Arg Asp Gly Ile Thr
1850 1855 1860

Gly Phe Pro Ala Asp Arg Gly Trp Asp Leu Asp Ser Leu Tyr Ser
1865 1870 1875

Asp Asp Pro Asp Arg Glu Gly Thr Ser Tyr Ala Arg Glu Gly Gly
1880 1885 1890

Phe Leu His Glu Ala Ala Glu Phe Asp Ala Ser Phe Phe Gly Ile
1895 1900 1905

Ser Pro Arg Glu Ala Leu Ala Met Asp Pro Gln Gln Arg Leu Leu
1910 1915 1920

Leu Glu Thr Thr Trp Glu Thr Phe Glu Arg Ala Gly Ile Asp Pro
1925 1930 1935

Thr Ser Leu Arg Gly Ser Arg Thr Gly Val Phe Val Gly Ser Asn
1940 1945 1950

Ala Gln Asp Tyr Leu Gln Leu Trp Leu Asn Asp Ala Asp Gly Leu
1955 1960 1965

Glu Gly His Leu Gly Thr Gly Asn Ala Ala Ser Val Val Ser Gly
1970 1975 1980

Arg Leu Ser Tyr Thr Phe Gly Leu Glu Gly Pro Ala Val Thr Val
1985 1990 1995

Asp Thr Ala Cys Ser Ser Ser Leu Val Thr Leu His Leu Ala Ala
2000 2005 2010

Gln Ala Leu Arg Arg Gly Glu Cys Ser Met Ala Leu Ala Gly Ala
2015 2020 2025

Val Thr Ile Met Ser Thr Pro Gly Ala Phe Thr Glu Phe Ser Arg
2030 2035 2040

Gln Arg Gly Leu Ala Ala Asp Gly Arg Ile Lys Ala Phe Ala Ala
2045 2050 2055

Ala Ala Asp Gly Thr Ser Trp Ser Glu Gly Val Gly Leu Leu Leu
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Val Glu Arg Leu Ser Asp Ala Arg Arg Asn Gly His Pro Val Leu
2075 2080 2085

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Ala Val  Val Arg Gly Thr Ala  Val Asn Gln Asp Gly  Ala Ser Asn
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Gly Leu  Thr Ala Pro Asn Gly  Pro Ser Gln Gln Arg  Val Ile Arg
     2105                 2110                 2115

Glu Ala  Leu Ala Asp Ala Gly  Leu Ser Ala Ala Glu  Val Asp Ala
     2120                 2125                 2130

Val Glu  Ala His Gly Thr Gly  Thr Thr Leu Gly Asp  Pro Ile Glu
     2135                 2140                 2145

Ala Gln  Ala Leu Leu Ala Thr  Tyr Gly Gln Gly Arg  Pro Asp Asp
     2150                 2155                 2160

Gln Pro  Leu Trp Leu Gly Ser  Val Lys Ser Asn Ile  Gly His Thr
     2165                 2170                 2175

Gln Ala  Val Ala Gly Ala Ala  Gly Ile Ile Lys Met  Val Met Ala
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Met Arg  His Gly Val Leu Pro  Gln Thr Leu His Ile  Asp Glu Pro
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Thr Pro  Tyr Val Asp Trp Ser  Ala Gly Asp Ile Ala  Leu Leu Thr
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Glu Gln  Arg Ala Trp Pro Glu  Thr Gly Arg Pro Arg  Arg Ala Gly
     2225                 2230                 2235

Val Ser  Ser Phe Gly Tyr Ser  Gly Thr Asn Ala His  Ala Val Ile
     2240                 2245                 2250

Glu Gln  Ala Pro Gln Asn Ala  Met Glu Arg Thr Pro  Gln Gly Asp
     2255                 2260                 2265

Asn Leu  Pro Ala Arg Thr Pro  Ala Thr Arg Thr Leu  Pro Val Leu
     2270                 2275                 2280

Pro Leu  Leu Val Ser Gly Arg  Thr Ala Pro Ala Leu  Arg Ala Gln
     2285                 2290                 2295

Ala Glu  Arg Leu Arg Pro Ala  Ala Thr Ala Leu Ala  Thr Gly Thr
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Val Thr  Asn Ser Gly Ala Leu  Glu Ala Leu Asp Leu  Gly Tyr Ser
     2315                 2320                 2325

Leu Ala  Thr Ser Arg Ala Ala  Leu Glu His Arg Ala  Val Leu Ile
     2330                 2335                 2340

Gly Thr  Pro Ser Asp Gly Gln  Ala Leu Ala Ser Arg  Leu Asp Ala
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Leu Ala  Ala Gly Glu Gln Val  Pro Gly Leu Val Gln  Gly Thr Ala
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Ser Gly  Gly Gly Leu Ala Phe  Leu Phe Thr Gly Gln  Gly Ser Gln
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Arg Leu  Gly Met Gly Arg Glu  Leu Tyr Glu Thr Tyr  Pro Val Phe
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Ala Val Thr Gln Pro Ala Leu Phe Ala Ile Glu Val Ala Leu Phe
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Arg Leu Val Glu Ser Trp Gly Leu Arg Pro Asp Phe Val Ala Gly
2450 2455 2460

His Ser Ile Gly Glu Ile Ala Ala Ala His Val Ala Gly Val Phe
2465 2470 2475

Ser Leu Glu Asp Ala Cys Arg Leu Val Glu Ala Arg Gly Arg Leu
2480 2485 2490

Met Gln Ala Leu Pro Gly Gly Gly Val Met Ile Ala Val Gln Ala
2495 2500 2505

Ser Glu Asp Glu Val Leu Pro Leu Leu Thr Asp Arg Val Ser Ile
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Ala Ala Ile Asn Gly Pro Gln Ser Val Val Ile Ala Gly Asp Glu
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Ala Asp Ala Val Ala Ile Ala Glu Ser Phe Thr Gly Arg Lys Ser
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Lys His Leu Ala Val Ser His Ala Phe His Ser Pro His Met Asp
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Gly Met Leu Glu Asp Phe Arg Ala Val Ala Glu Gly Leu Ser Tyr
2570 2575 2580

Glu Ala Pro Arg Ile Ala Val Val Ser Asn Leu Thr Gly Ala Leu
2585 2590 2595

Val Ser Asp Glu Met Ser Ser Ala Glu Phe Trp Val Arg His Val
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Arg Glu Ala Val Arg Phe Leu Asp Gly Ile Arg Ala Leu Glu Ala
2615 2620 2625

Ala Gly Val Thr Thr Tyr Val Glu Leu Gly Pro Gly Gly Val Leu
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Ser Ala Leu Ala Gln Glu Cys Val Ser Gly Asp Gly Ala Ala Phe
2645 2650 2655

Val Pro Val Leu Arg Ser Gly Arg Ser Glu Ala Glu Thr Val Val
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Thr Ala Leu Ala Gln Ala His Val Arg Gly Val Glu Val Asp Trp
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Ala Ala Phe Phe Ala Gly Thr Gly Ala Glu Arg Ile Asp Leu Pro
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Ser Thr Val Gly Pro Val Val Ala Glu Ala Val Asp Ala Val Asp
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Ala Arg Phe Trp Asp Ala Val Glu Arg Glu Asp Leu Ala Ser Leu
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Val Ala Glu Leu Asp Val Asp Glu Thr Pro Leu Gly Glu Val Val
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Pro Ala Leu Ser Ala Trp Arg Arg Glu Arg Arg Ala Gln Ser Glu
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Val Asp Gly Trp Arg Tyr Arg Val Ser Trp Lys Pro Leu Ala Asp
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Ala Ser Thr Ala Arg Leu Ser Gly Ser Trp Val Val Val Ser Pro
2795 2800 2805

Asp Lys Gly Val Asp Asp Ser Ala Val Val Ala Gly Leu Ala Gly
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Arg Gly Ala Glu Val Arg Arg Val Val Val Glu Ala Gly Val Asp
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Arg Ser Ala Leu Ala Gly Leu Leu Ala Asp Ala Gly Ser Ala Ala
2840 2845 2850

Gly Val Val Ser Leu Leu Gly Leu Asp Glu Ser Glu Gly Leu Leu
2855 2860 2865

Gly Thr Val Gly Leu Val Gln Ala Leu Gly Asp Ala Gly Val Glu
2870 2875 2880

Ala Pro Leu Trp Cys Leu Thr Arg Gly Ala Val Ser Val Gly Arg
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Ser Asp Arg Leu Val Ser Pro Val Gln Ala Gln Val Trp Gly Leu
2900 2905 2910

Gly Arg Val Ala Ala Leu Glu Val Pro Glu His Trp Gly Gly Leu
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Val Asp Leu Pro Glu Val Leu Asp Glu Arg Ala Val Ala Arg Leu
2930 2935 2940

Val Gly Val Leu Ala Gly Ser Gly Glu Asp Gln Val Ala Val Arg
2945 2950 2955

Ser Ser Gly Val Phe Gly Arg Arg Leu Val Arg Ala Pro Arg Ala
2960 2965 2970

Glu Gly Ala Ala Ala Trp Thr Pro Thr Gly Thr Val Leu Val Thr
2975 2980 2985

Gly Gly Thr Gly Val Leu Gly Gly Arg Val Ala Arg Trp Leu Ala
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Gly Ala Gly Ala Glu Arg Leu Val Leu Thr Ser Arg Arg Gly Pro
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Asp Ala Pro Gly Ala Ala Glu Leu Val Glu Glu Leu Thr Thr Gly
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Phe Gly Val Glu Val Ser Ile Val Ala Cys Asp Ala Ala Asp Arg
3035 3040 3045

Asp Ala Leu Arg Ala Leu Leu Ser Ala Glu Ala Gly Thr Leu Thr
3050 3055 3060

Ala Val Ile His Thr Ala Gly Val Leu Asp Asp Gly Val Leu Asp
3065 3070 3075

Ala Leu Thr Pro Asp Arg Ile Asp Ser Val Leu Arg Ala Lys Ala
3080 3085 3090

Val Ser Ala Leu Asn Leu His Glu Leu Thr Ala Glu Leu Asp Ile
3095 3100 3105

Glu Leu Ser Ala Phe Val Leu Phe Ser Ser Met Ser Gly Thr Val
3110 3115 3120

Gly Ala Ala Gly Gln Ala Asn Tyr Ala Ala Ala Asn Ala Phe Leu
3125 3130 3135

Asp Ala Leu Ala Glu Gln Arg Arg Ala Asp Gly Leu Ala Ala Thr
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Ser Leu Ala Trp Gly Pro Trp Ala Glu Gly Gly Met Ala Ala Asp
3155 3160 3165

Ala Ala Leu Glu Ala Arg Met Arg Arg Gly Gly Val Pro Pro Met
3170 3175 3180

Asp Ala Glu Leu Ala Leu Ser Ala Leu Arg Gln Ala Ile Gly Ser
3185 3190 3195

Ala Asp Ala Ala Leu Thr Ile Val Asp Phe Asp Trp Ala Arg Phe
3200 3205 3210

Ala Pro Gly Phe Thr Ala Val Arg Ala Gly Asn Leu Leu Ala Glu
3215 3220 3225

Leu Pro Glu Ala Ala Ala Val Met Arg Gly Pro Glu Asn Ala Asp
3230 3235 3240

Ser Arg Pro Glu His Ala Asp Ser Ser Leu Ala Leu Arg Leu Gln
3245 3250 3255

Gly Met Ala Gln Ala Asp Gln Glu Pro Phe Leu Leu Glu Leu Val
3260 3265 3270

Arg Ala Gln Val Ala Glu Val Leu Gly His Ser Gly Ala Glu Asp
3275 3280 3285

Ile Glu Ala Gly Arg Ala Phe Arg Glu Ile Gly Phe Asp Ser Leu
3290 3295 3300

Thr Ala Val Glu Leu Arg Asn Arg Leu Gly Ala Ala Ala Glu Leu
3305 3310 3315

Arg Leu Pro Ala Thr Leu Val Tyr Asp Tyr Pro Thr Pro Ala Ala
3320 3325 3330

Leu Ala Val His Leu Arg Thr Glu Leu Leu Gly Lys Gln Val Val
3335 3340 3345

Val Ser Gly Pro Val Ser Lys Val Val Asp Asp Asp Pro Ile Ala
3350 3355 3360

Ile Val Ser Met Ser Cys Arg Phe Pro Gly Gly Val Arg Thr Pro
3365 3370 3375

Glu Asp Leu Trp Glu Leu Leu Ser Thr Gly Gly Asp Ala Ile Ser
3380 3385 3390

Asp Leu Pro Leu Asp Arg Gly Trp Asp Ile Asp Ala Leu Tyr Asp
3395 3400 3405

Ala Asp Pro Ser Thr Gln Gly Thr Ser Tyr Ala Arg Ala Gly Gly
3410 3415 3420

Phe Leu Tyr Asp Ala Ala Asp Phe Asp Ala Asp Phe Phe Gly Ile
3425 3430 3435

Ser Pro Arg Glu Ala Leu Ala Met Asp Pro Gln Gln Arg Leu Leu
3440 3445 3450

Leu Glu Thr Ser Trp Glu Ala Phe Glu Arg Ala Gly Ile Asp Pro
3455 3460 3465

Glu Thr Leu Arg Gly Ser Gln Ala Gly Val Phe Val Gly Thr Asn
3470 3475 3480

Gly Gln Asp Tyr Leu Ser Val Leu Leu Glu Glu Pro Glu Gly Leu
3485 3490 3495

Glu Gly His Leu Gly Thr Gly Asn Ala Ala Ser Val Val Ser Gly
3500 3505 3510

Arg Leu Ser Tyr Val Phe Gly Leu Glu Gly Pro Ala Val Thr Val
3515 3520 3525

Asp Thr Ala Cys Ser Ser Ser Leu Val Ala Leu His Trp Ala Ile
3530 3535 3540

Gln Ala Leu Arg Asn Gly Glu Cys Ser Leu Ala Leu Ala Gly Gly
3545 3550 3555

Val Thr Val Met Ser Thr Pro Gly Thr Phe Ile Glu Phe Ser Arg
3560 3565 3570

Gln Arg Gly Leu Ala Glu Asp Gly Arg Ile Lys Ala Phe Ala Ala
3575 3580 3585

Ala Ala Asp Gly Thr Gly Trp Gly Glu Gly Val Gly Met Leu Leu
3590 3595 3600

Val Glu Arg Leu Ser Asp Ala Glu Arg Asn Gly His Pro Val Leu
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Ala Ile Val Arg Gly Ser Ala Ile Asn Gln Asp Gly Ala Ser Asn
3620 3625 3630

Gly Leu Thr Ala Pro Asn Gly Pro Ser Gln Gln Arg Val Ile Arg
3635 3640 3645

Ala Ala Leu Ala Ser Ala Gly Leu Ser Ala Ala Asp Val Asp Ala
3650 3655 3660

Val Glu Ala His Gly Thr Gly Thr Thr Leu Gly Asp Pro Ile Glu
3665 3670 3675

Ala Gln Ala Leu Leu Ala Thr Tyr Gly Gln Asp Arg Pro Ala Asp
3680 3685 3690

Arg Pro Leu Gln Leu Gly Ser Ile Lys Ser Asn Ile Gly His Thr
3695 3700 3705

Gln Ala Ala Ala Gly Val Ala Gly Val Ile Lys Met Val Leu Ala
3710 3715 3720

Met Glu His Gly Val Leu Pro Gln Ser Leu His Ile Asp Ala Pro
3725 3730 3735

Ser Pro Gln Val Asp Trp Glu Ala Gly Asp Ile Ala Leu Leu Thr
3740 3745 3750

Glu Gln Arg Gln Trp Pro Glu Thr Gly Arg Pro Arg Arg Ala Gly
3755 3760 3765

Val Ser Ser Phe Gly Phe Ser Gly Thr Asn Ala His Thr Ile Ile
3770 3775 3780

Glu Gln Ala Pro Ala Ser Thr Glu Thr Asp Arg Ala Glu Ser Gly
3785 3790 3795

Ser Val Glu Pro Asp Phe Val Pro Leu Met Leu Ser Ala Lys Ser
3800 3805 3810

Asp Val Ala Leu Arg Ala Gln Ala Ala Ser Leu Arg Ala Arg Leu
3815 3820 3825

Ile Ala Ala Pro Asp Met Arg Leu Ser Asp Val Gly Ser Thr Leu
3830 3835 3840

Thr Thr Gly Arg Ser Ala Phe Glu Arg Arg Ala Ala Leu Val Ala
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Gly Gly Arg Glu Gly Leu Leu Ala Gly Leu Glu Ala Leu Ala Asp
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Gly Gly Ser Ala Ala Gly Leu Val Glu Gly Ser Pro Val Ser Gly
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Lys Leu Ala Phe Leu Phe Thr Gly Gln Gly Ser Gln Arg Leu Gly
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Met Gly Arg Glu Leu Tyr Glu Ala Tyr Pro Val Phe Ala Asp Ala
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Leu Asp Ala Val Cys Val Arg Leu Glu Leu Pro Leu Met Asp Val
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Leu Phe Gly Ala Asp Ala Gly Leu Leu Asn Glu Thr Ala Tyr Thr
3935 3940 3945

Gln Pro Ala Leu Phe Ala Val Glu Val Ala Leu Phe Arg Leu Val
3950 3955 3960

Glu Ser Trp Gly Leu Arg Pro Asp Phe Leu Ala Gly His Ser Ile
3965 3970 3975

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Gly Glu  Ile Ala Ala Ala His  Val Ala Gly Val Leu  Ser Leu Asp
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Asp Ala  Cys Ala Leu Val Glu  Ala Arg Gly Arg Leu  Met Gly Ala
    3995                 4000                 4005

Leu Pro  Ala Gly Gly Val Met  Ile Ala Val Gln Ala  Ser Glu Asp
    4010                 4015                 4020

Glu Val  Leu Pro Leu Leu Thr  Asp Arg Val Ser Ile  Ala Ala Ile
    4025                 4030                 4035

Asn Gly  Pro Gln Ser Val Val  Ile Ala Gly Asp Glu  Ala Asp Ala
    4040                 4045                 4050

Val Ala  Ile Val Glu Ser Phe  Thr Gly Arg Lys Ser  Lys Arg Leu
    4055                 4060                 4065

Ser Val  Ser His Ala Phe His  Ser Pro His Met Asp  Gly Met Leu
    4070                 4075                 4080

Glu Asp  Phe Arg Val Val Ala  Glu Gly Leu Ser Tyr  Asp Ala Pro
    4085                 4090                 4095

Arg Ile  Pro Val Val Ser Asn  Leu Thr Gly Ala Leu  Val Thr Asp
    4100                 4105                 4110

Glu Met  Gly Ser Ala Asp Phe  Trp Val Arg His Val  Arg Glu Ala
    4115                 4120                 4125

Val Arg  Phe Leu Asp Gly Ile  Arg Ala Leu Glu Ala  Ala Gly Val
    4130                 4135                 4140

Thr Thr  Tyr Val Glu Leu Gly  Pro Asp Gly Val Leu  Ser Ala Met
    4145                 4150                 4155

Ala Gln  Glu Cys Val Thr Glu  Gly Gly Ala Ala Phe  Val Pro Val
    4160                 4165                 4170

Leu Arg  Lys Gly Arg Pro Glu  Ala Glu Thr Val Met  Ala Thr Leu
    4175                 4180                 4185

Gly Gln  Ala His Val Arg Gly  Val Ala Val Asp Trp  His Ser Val
    4190                 4195                 4200

Tyr Gly  Thr Gly Ala Gln Arg  Val Asp Leu Pro Thr  Tyr Ser Phe
    4205                 4210                 4215

Gln Arg  Gln Arg Tyr Trp Pro  Ala Ala Ser Ser Thr  Ala Gly Gly
    4220                 4225                 4230

Ser Val  Asp Arg Ser Val Asp  Ala Val Asp Ala Arg  Phe Trp Asp
    4235                 4240                 4245

Ala Val  Glu Arg Glu Asp Leu  Ala Ser Leu Ala Ala  Glu Leu Asp
    4250                 4255                 4260

Leu Asp  Asp Asp Ala Pro Phe  Ser Glu Leu Ala Pro  Ala Leu Ser
    4265                 4270                 4275

Ala Trp  Arg Arg Glu Arg Arg  Ala Leu Ser Glu Val  Asp Gly Trp
    4280                 4285                 4290
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Arg Tyr  Arg Val Ser Trp Lys  Pro Leu Ala Asp Val  Ser Ala Ser
    4295                 4300                 4305

Gly Leu  Ser Gly Ser Trp Val  Val Ile Ser Pro Ala  Gly Gly Val
    4310                 4315                 4320

Asp Asp  Ser Ala Val Val Gly  Ala Leu Val Gly Arg  Gly Ala Glu
    4325                 4330                 4335

Val Arg  Arg Val Val Val Glu  Ala Gly Val Asp Arg  Ser Ala Leu
    4340                 4345                 4350

Ala Gly  Leu Leu Ala Asp Ala  Gly Ser Ala Ala Gly  Val Val Ser
    4355                 4360                 4365

Leu Leu  Gly Leu Asp Glu Ser  Glu Gly Leu Leu Gly  Thr Val Gly
    4370                 4375                 4380

Leu Val  Gln Ala Leu Gly Asp  Ala Gly Val Glu Ala  Pro Leu Trp
    4385                 4390                 4395

Cys Leu  Thr Arg Gly Ala Val  Ser Val Gly Arg Ser  Asp Arg Leu
    4400                 4405                 4410

Val Ser  Pro Val Gln Ala Gln  Val Trp Gly Leu Gly  Arg Val Ala
    4415                 4420                 4425

Ala Leu  Glu Val Pro Glu Arg  Trp Gly Gly Leu Ile  Asp Leu Pro
    4430                 4435                 4440

Glu Val  Leu Asp Glu Arg Ala  Val Ser Arg Leu Val  Gly Val Leu
    4445                 4450                 4455

Ser Gly  Gly Gly Ser Gly Glu  Asp Gln Val Ala Val  Arg Ser Ser
    4460                 4465                 4470

Gly Val  Phe Gly Arg Arg Leu  Val Arg Ala Pro Arg  Ala Glu Gly
    4475                 4480                 4485

Ala Ser  Ala Trp Ser Pro Thr  Gly Thr Val Leu Val  Thr Gly Gly
    4490                 4495                 4500

Thr Gly  Val Leu Gly Gly Arg  Val Ala Arg Trp Leu  Ala Gly Ala
    4505                 4510                 4515

Gly Ala  Glu Arg Leu Val Leu  Thr Ser Arg Arg Gly  Pro Asp Ala
    4520                 4525                 4530

Pro Gly  Ala Ala Glu Leu Val  Glu Glu Leu Ala Gly  Ser Gly Val
    4535                 4540                 4545

Glu Val  Ser Val Val Ala Cys  Asp Ala Ala Asp Arg  Asp Ala Leu
    4550                 4555                 4560

Arg Ala  Leu Leu Ser Ala Glu  Ala Gly Thr Leu Thr  Ala Val Ile
    4565                 4570                 4575

His Thr  Ala Gly Val Leu Asp  Asp Gly Val Leu Asp  Ala Leu Thr
    4580                 4585                 4590

Pro Asp  Arg Ile Asp Ser Val  Leu Arg Ala Lys Ala  Val Ser Ala
    4595                 4600                 4605
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Ile Asn  Leu His Glu Leu Thr  Ala Glu Leu Gly Ile  Glu Leu Ser
    4610                 4615                 4620

Ala Phe  Val Leu Phe Ser Ser  Val Thr Gly Thr Trp  Gly Thr Ala
    4625                 4630                 4635

Gly Gln  Ala Asn Tyr Ala Ala  Ala Asn Ala Tyr Leu  Asp Ala Leu
    4640                 4645                 4650

Ala Glu  Gln Arg Arg Ala Asp  Gly Leu Ala Ala Thr  Ser Ile Ala
    4655                 4660                 4665

Trp Gly  Pro Trp Ala Glu Gly  Gly Met Ala Ala Asp  Ala Ala Leu
    4670                 4675                 4680

Glu Ala  Arg Met Arg Arg Gly  Gly Val Pro Pro Met  Lys Gly Glu
    4685                 4690                 4695

Ala Ala  Val Asn Ala Leu Gln  Arg Ala Leu Asn Ala  Asn Asp Thr
    4700                 4705                 4710

Val Val  Thr Val Val Asp Val  Glu Trp Glu Arg Phe  Ala Pro Gly
    4715                 4720                 4725

Phe Thr  Ala Ala Arg Ala Ser  Thr Leu Leu Ala Glu  Leu Pro Glu
    4730                 4735                 4740

Ala Gln  Arg Ala Leu Ala Pro  Gln Glu Gly Asp Glu  Gly Gln Asp
    4745                 4750                 4755

Asp Gly  Ala Val His Gly Arg  Gly Gly His Ser Leu  Ala Glu Arg
    4760                 4765                 4770

Leu Ala  Glu Leu Ser Ala Ala  Glu Arg Asp Arg Leu  Leu Leu Gly
    4775                 4780                 4785

Leu Val  Arg Lys Glu Val Ala  Ala Val Leu Gly His  Ala Gly Val
    4790                 4795                 4800

Glu Ser  Ile Gly Ala Ala Arg  Ala Phe Lys Glu Leu  Gly Phe Asp
    4805                 4810                 4815

Ser Leu  Thr Ala Val Glu Leu  Arg Asn Arg Leu Gly  Ala Val Thr
    4820                 4825                 4830

Gly Leu  Arg Leu Pro Ala Thr  Leu Ile Tyr Asp Tyr  Pro Thr Ser
    4835                 4840                 4845

Gly Ala  Leu Ala Glu Tyr Leu  Arg Gly Glu Leu Leu  Gly Thr Gln
    4850                 4855                 4860

Ala Val  Val Ser Gly Pro Val  Ser Asn Ala Val Ala  Val Asp Asp
    4865                 4870                 4875

Asp Pro  Ile Ala Ile Val Ala  Met Ser Cys Arg Phe  Pro Gly Gly
    4880                 4885                 4890

Val Arg  Thr Pro Glu Asp Leu  Trp Gln Leu Leu Ala  Thr Gly Arg
    4895                 4900                 4905

Asp Ala  Ile Gly Glu Phe Pro  Glu Asp Arg Gly Trp  Asp Ala Glu
    4910                 4915                 4920
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Ala Leu Phe Gly Pro Gln Phe Glu Gln Asp Ala Pro Tyr Ala Arg
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Glu Gly Gly Phe Leu Tyr Asp Val Ala Asp Phe Asp Pro Ala Phe
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Phe Gly Ile Ser Pro Arg Glu Ala Leu Ala Met Asp Pro Gln Gln
4955 4960 4965

Arg Leu Leu Leu Glu Thr Ser Trp Glu Ala Phe Glu Arg Ala Gly
4970 4975 4980

Ile Asp Pro Leu Ser Val Arg Gly Ser Gln Ala Gly Val Phe Val
4985 4990 4995

Gly Thr Asn Gly Gln Asp Tyr Leu Ser Leu Val Leu Asn Ser Ala
5000 5005 5010

Asp Gly Gly Asp Gly Phe Met Ser Thr Gly Asn Ser Ala Ser Val
5015 5020 5025

Val Ser Gly Arg Leu Ser Tyr Val Phe Gly Leu Glu Gly Pro Ala
5030 5035 5040

Val Thr Val Asp Thr Ala Cys Ser Ala Ser Leu Val Ala Leu His
5045 5050 5055

Leu Ala Val Gln Ala Leu Arg Asn Gly Glu Cys Ser Leu Ala Leu
5060 5065 5070

Ala Gly Gly Val Thr Val Met Ser Thr Pro Gly Ala Phe Ala Glu
5075 5080 5085

Phe Ser Arg Gln Arg Gly Leu Ala Glu Asp Gly Arg Ile Lys Ala
5090 5095 5100

Phe Ala Ala Ala Ala Asp Gly Thr Gly Trp Gly Glu Gly Val Gly
5105 5110 5115

Met Leu Leu Val Glu Arg Leu Ser Asp Ala Arg Arg Asn Gly His
5120 5125 5130

Pro Val Leu Ala Leu Val Arg Gly Ser Ala Val Asn Gln Asp Gly
5135 5140 5145

Ala Ser Asn Gly Leu Thr Ala Pro Asn Gly Pro Ser Gln Gln Arg
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Val Ile Arg Ala Ala Leu Ala Ser Ala Gly Leu Ala Pro Gly Asp
5165 5170 5175

Ile Asp Ala Val Glu Ala His Gly Thr Gly Thr Lys Leu Gly Asp
5180 5185 5190

Pro Ile Glu Ala Gln Ala Leu Leu Ala Thr Tyr Gly Gln Asp Arg
5195 5200 5205

Pro Ala Asp Arg Pro Leu Gln Leu Gly Ser Ile Lys Ser Asn Ile
5210 5215 5220

Gly His Thr Gln Ala Ala Ala Gly Val Ala Gly Leu Met Lys Met
5225 5230 5235

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Val Leu  Ala Met Gln His Gly  Val Leu Pro Gln Thr  Leu His Val
    5240                 5245                 5250

Asp Glu  Pro Thr Pro His Val  Asp Trp Ser Ala Gly  Asp Ile Ala
    5255                 5260                 5265

Leu Leu  Thr Glu Arg Arg Glu  Trp Pro Glu Thr Gly  Arg Pro Arg
    5270                 5275                 5280

Arg Ala  Gly Ile Ser Ser Phe  Gly Val Ser Gly Thr  Asn Ala His
    5285                 5290                 5295

Thr Ile  Leu Glu Gln Ala Pro  Pro Leu Thr Glu Lys  Asp Glu Ala
    5300                 5305                 5310

Glu Ala  Ala Arg Pro Glu Thr  Gly Ser Ala Val Ser  Ala Trp Pro
    5315                 5320                 5325

Leu Ala  Gly Lys Thr Glu Ala  Gly Leu Arg Glu Gln  Ala Glu Arg
    5330                 5335                 5340

Leu Leu  Ala His Ile Asp Ala  His Ser Glu Leu Arg  Pro Val Asp
    5345                 5350                 5355

Val Gly  His Ser Leu Ala Thr  Gly Arg Ala Ala Phe  Asp His Arg
    5360                 5365                 5370

Ala Val  Leu Val Ala Gly Asp  Asp Arg Ser Glu Phe  Arg Arg Ala
    5375                 5380                 5385

Leu Ala  Ala Leu Ala Ser Gly  Glu Ser Val Ala Gln  Val Val Gln
    5390                 5395                 5400

Gly Ile  Ala Arg Pro Asp Gln  Gln Val Ala Phe Leu  Phe Thr Gly
    5405                 5410                 5415

Gln Gly  Ser Gln Arg Leu Gly  Met Gly Arg Glu Leu  Tyr Glu Thr
    5420                 5425                 5430

Tyr Pro  Val Phe Ala Asp Ala  Leu Asp Ala Val Cys  Ala Arg Leu
    5435                 5440                 5445

Glu Leu  Pro Leu Lys Asp Val  Leu Phe Gly Gly Asp  Ala Asp Arg
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Leu Asn  Glu Thr Ala Tyr Thr  Gln Pro Ala Leu Phe  Ala Val Glu
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Val Ala  Leu Phe Arg Leu Val  Glu Ser Trp Gly Val  Arg Pro Asp
    5480                 5485                 5490

Phe Leu  Ala Gly His Ser Ile  Gly Glu Ile Ala Ala  Ala His Val
    5495                 5500                 5505

Ala Gly  Val Phe Ser Leu Asp  Asp Ala Cys Ala Leu  Val Glu Ala
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Arg Gly  Arg Leu Met Gln Ala  Leu Pro Thr Gly Gly  Val Met Ile
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Ala Val  Gln Ala Ser Glu Ala  Glu Val Leu Pro Leu  Leu Thr Glu
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Asp Arg Lys Ser Lys Arg Leu Ala Val Ser His Ala Phe His Ser
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Pro His Met Asp Gly Met Leu Ala Asp Phe Arg Lys Val Ala Glu
5600 5605 5610

Glu Leu Ser Tyr Glu Ala Pro Arg Ile Pro Ile Val Ser Asn Leu
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Thr Gly Ala Leu Val Thr Asp Glu Met Gly Ser Ala Asp Phe Trp
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Val Arg His Val Arg Glu Ala Val Arg Phe Leu Asp Gly Ile Arg
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Asp Gly Val Leu Ser Ala Met Ala Gln Glu Cys Val Thr Gly Glu
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Gly Ala Ala Phe Val Pro Ala Leu Arg Lys Gly Arg Pro Glu Ala
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Glu Thr Ile Thr Ala Ala Leu Ala His Ala His Thr His Gly Ile
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Ala Val Asp Trp Gln Ala Tyr Phe Ala Gly Thr Gly Ala Gln Arg
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Val Asp Leu Pro Thr Tyr Ala Phe Gln Arg Gln Arg Tyr Trp Val
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Asp Ser Phe Ala Glu Phe Asp Asp Val Ala Ser Ala Gly Ile Gly
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Asn Ala Thr Gly Leu Leu Ser Thr Gly Gly Ser Gly Ser Asp Val
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Gln Val Asp Val Thr Ala Val Arg Glu Arg Leu Ala Ala Ala Gly
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Leu His His Gly Pro Gly Phe Arg Thr Leu Thr Glu Val Trp Val
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Arg Gly Glu Glu Val Phe Ala Glu Ala Arg Leu Ser Asp Glu Leu
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Ser Ala Ser Ala Gly Arg Phe Ala Leu His Pro Thr Leu Leu Asp
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Ala Ala Ser Gln Ala Leu Ala Ala Gly Thr Thr Ala Ala Ala Ser
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Gly Ile Gly Gly Ala Gly Arg Leu Pro Gln Ala Trp Arg Gly Val
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Leu Phe Arg Leu Asp Trp Val Arg Thr Thr Ala Pro Gly Arg Pro
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Val Glu Asp Leu Ala His Ala Pro Val Trp Gly Leu Leu Arg Ala
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Ala Gln Val Thr Trp Ala Ala Cys Asp Val Ala Asp Arg Asp Ala
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Ala Val Val His Thr Ala Ala Val Leu Asp Asp Gly Val Val Asp
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Leu Leu Thr Pro Glu Arg Val Asp Arg Val Leu Arg Pro Lys Ala
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Glu Ala Ala Leu His Leu His Glu Leu Thr Lys Asp Leu Asp Leu
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Ser Ala Phe Val Leu Phe Ser Ala Ala Ala Gly Thr Leu Gly Gly
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Ala Gly Gln Ala Asn Tyr Ala Ala Ala Asn Val Phe Leu Asp Ala
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Leu Ala Arg His Arg Thr Ala Arg Gly Leu Thr Ala Leu Ser Leu
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Val Trp Gly Met Trp Ala Glu Glu Arg Gly Met Ala Gly Arg Leu
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Thr Glu Ala Glu Leu Gly Arg Ala Gly Arg Gly Gly Val Ala Pro
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Leu Ser Ala Thr Glu Gly Leu Ala Leu Phe Asp Ala Ala Leu Ala
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Leu Ala Arg Gln Leu Ala Glu Leu Ser Val Ala Glu Arg Glu Arg
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Thr Val Leu Asp Leu Val Arg Gly Gln Val Ala Ala Val Leu Gly
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Tyr Gly Ser Ala Glu His Ile Gly Gly Glu Gln Ala Phe Lys Glu
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ggcatgagct gccgcttccc gggcggagtc agctcgcccg aggacctgtg gagactcgtc 180

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20 25 30

His Glu Pro Ile Ala Ile Thr Ala Met Ser Cys Arg Phe Pro Gly Gly
35 40 45

Val Arg Ser Pro Glu Glu Leu Trp Glu Leu Leu Arg Thr Gly Gly Asp
50 55 60

Ala Leu Thr Ala Phe Pro Ala Asp Arg Gly Trp Asp Leu Asp Asn Leu
65 70 75 80

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Phe Ser Asp Asp Pro Asp Asp His Asn Thr Ser Val Thr Arg Glu Gly
                85                  90                  95

Gly Phe Leu Gly Glu Ala Ser Ser Phe Asp Ala Ala Phe Phe Gly Ile
            100                 105                 110

Ser Pro Arg Glu Ala Met Ala Met Asp Pro Gln Gln Arg Leu Leu Leu
        115                 120                 125

Glu Thr Ser Trp Glu Ala Phe Glu Arg Ala Gly Ile Asp Pro Gln Ala
    130                 135                 140

Leu Arg Gly Ser Gln Ser Gly Val Phe Val Gly Ile Asn Gly Ser Asp
145                 150                 155                 160

Tyr Leu Thr Pro Leu Leu Glu Ala Ala Glu Asp Tyr Ala Gly His Leu
                165                 170                 175

Gly Thr Gly Asn Ala Ser Ser Val Met Ser Gly Arg Leu Ser Tyr Thr
            180                 185                 190

Phe Gly Leu Glu Gly Pro Ala Val Thr Val Asp Thr Ala Cys Ser Ala
        195                 200                 205

Ser Leu Val Ala Leu His Leu Ala Val Gln Ala Leu Arg Ala Gly Glu
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Cys Ser Leu Ala Val Ala Gly Gly Val His Val Met Ser Thr Pro Gly
225                 230                 235                 240

Leu Phe Val Glu Phe Ser Lys Gln Arg Gly Leu Ser Thr Asp Gly Arg
                245                 250                 255

Cys Lys Ala Phe Ala Ala Gly Ala Asp Gly Phe Gly Pro Ala Glu Gly
            260                 265                 270

Val Gly Val Leu Leu Leu Glu Arg Leu Ser Asp Ala Arg Lys Asn Gly
        275                 280                 285

Arg Pro Val Leu Ala Val Val Arg Gly Ser Ala Val Asn Gln Asp Gly
    290                 295                 300

Ala Ser Asn Gly Leu Thr Ala Pro Asn Gly Pro Ser Gln Gln Arg Val
305                 310                 315                 320

Ile Arg Gln Ala Leu Ala Asn Ala Arg Leu Ser Thr Asp Gln Val Asp
                325                 330                 335

Val Val Glu Ala His Gly Thr Gly Thr Ser Leu Gly Asp Pro Ile Glu
            340                 345                 350

Ala Gln Ala Leu Ile Ala Thr Tyr Gly Gln Asp Arg Pro Ala Asp Gln
        355                 360                 365

Pro Leu Leu Leu Gly Ser Val Lys Ser Asn Ile Gly His Thr Gln Ala
    370                 375                 380

Ala Ala Gly Val Ala Gly Val Ile Lys Met Val Leu Ala Met Gln His
385                 390                 395                 400

Gly Val Leu Pro Gln Ser Leu His Ile Asp Glu Pro Ser Pro His Val
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Asp Trp Glu Ser Gly Ala Val Ser Leu Leu Thr Glu Gln Thr Ala Trp
            420                 425                 430

Pro Glu Thr Thr His Pro Arg Arg Ala Gly Val Ser Ser Phe Gly Phe
        435                 440                 445

Ser Gly Thr Asn Ala His Val Ile Val Glu Gln Ala Pro Val Val Glu
    450                 455                 460

Glu Val Ala Gly Asp Pro Ala Gly Val Val Glu Gly Ser Gly Pro Gly
465                 470                 475                 480

Val Val Pro Val Val Pro Trp Val Leu Ser Gly Lys Ser Ala Gly Ala
                485                 490                 495

Leu Arg Ala Gln Ala Glu Arg Leu Ser Gly Phe Leu Ala Gly Ala Ser
            500                 505                 510

Ala Val Asp Val Pro Ser Val Asp Val Gly Trp Ser Leu Ala Ser Ser
        515                 520                 525

Arg Ala Gly Leu Glu His Arg Ala Val Val Leu Gly Asp His Ala Ala
    530                 535                 540

Gly Val Ala Ala Val Ala Ser Gly Val Met Ala Ala Gly Val Val Thr
545                 550                 555                 560

Gly Ser Val Val Gly Gly Lys Thr Ala Phe Val Phe Pro Gly Gln Gly
                565                 570                 575

Ser Gln Trp Val Gly Met Ala Val Gly Leu Leu Asp Ser Ser Pro Val
            580                 585                 590

Phe Ala Ala Arg Val Glu Glu Cys Ala Lys Ala Leu Glu Pro Phe Thr
        595                 600                 605

Asp Trp Ser Leu Val Asp Val Leu Arg Gly Val Glu Gly Ala Pro Ser
    610                 615                 620

Leu Glu Arg Val Asp Val Val Gln Pro Ala Leu Phe Ala Val Met Val
625                 630                 635                 640

Ser Leu Ala Glu Val Trp Arg Ala Ala Gly Val Arg Pro Gly Ala Val
                645                 650                 655

Ile Gly His Ser Gln Gly Glu Ile Ala Ala Ala Cys Val Ala Gly Ile
            660                 665                 670

Leu Ser Leu Glu Asp Ala Ala Arg Val Val Ala Leu Arg Ser Gln Ala
        675                 680                 685

Ile Gly Arg Val Leu Ala Gly Leu Gly Gly Met Val Ser Val Pro Leu
    690                 695                 700

Pro Ala Lys Ala Val Arg Glu Leu Ile Ala Pro Trp Gly Glu Gly Arg
705                 710                 715                 720

Ile Ser Val Ala Ala Val Asn Gly Pro Ser Ser Val Val Val Ser Gly
                725                 730                 735

Glu Ala Ala Ala Leu Asp Glu Leu Leu Val Ser Cys Glu Ser Glu Gly
            740                 745                 750
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Val Arg Ala Lys Arg Ile Ala Val Asp Tyr Ala Ser His Ser Ala Gln
        755                 760                 765

Val Glu Leu Leu Arg Glu Glu Leu Ala Glu Leu Leu Ala Pro Ile Val
    770                 775                 780

Pro Arg Ala Ala Glu Val Pro Phe Leu Ser Thr Val Thr Gly Glu Trp
785                 790                 795                 800

Val Arg Gly Pro Glu Leu Asp Gly Gly Tyr Trp Phe Gln Asn Leu Arg
                805                 810                 815

Arg Thr Val Glu Leu Glu Glu Ala Thr Arg Thr Leu Leu Glu Gln Gly
            820                 825                 830

Phe Gly Val Phe Val Glu Ser Ser Pro His Pro Val Leu Ser Val Gly
        835                 840                 845

Met Gln Glu Thr Val Glu Asp Ala Gly Arg Glu Ala Ala Val Leu Gly
    850                 855                 860

Ser Leu Arg Arg Gly Glu Gly Gly Leu Glu Arg Phe Trp Leu Ser Leu
865                 870                 875                 880

Gly Glu Ala Trp Val Arg Gly Val Gly Val Asp Trp His Ala Val Phe
                885                 890                 895

Ala Gly Thr Gly Ala Gln Arg Val Asp Leu Pro Thr Tyr Ala Phe Gln
            900                 905                 910

Ser Gln Arg Phe Trp Pro Glu Ala Ala Pro Ile Glu Ala Val Ala Val
        915                 920                 925

Ser Ala Glu Ser Ala Ile Asp Ala Arg Phe Trp Glu Ala Val Glu Arg
    930                 935                 940

Glu Asp Leu Glu Ala Leu Thr Ala Glu Leu Asp Ile Glu Gly Asp Gln
945                 950                 955                 960

Pro Leu Thr Ala Leu Leu Pro Ala Leu Ser Ser Trp Arg Arg Gln Ser
                965                 970                 975

Arg Glu His Ser Thr Val Asp Gly Trp Arg Tyr Arg Val Thr Trp Lys
            980                 985                 990

Arg Ile Ala Glu Pro Ser Pro Ala  Arg Leu Ser Gly Thr  Trp Leu Val
        995                 1000                1005

Val Val  Pro Glu Val Gly Pro  Ala Asp Glu Trp Thr  Gly Ala Val
    1010                1015                1020

Leu Arg  Met Leu Ala Glu Arg  Gly Ala Glu Val Arg  Thr Val Thr
    1025                1030                1035

Val Pro  Ala Asp Gly Ala Asp  Arg Asp Arg Leu Ala  Val Thr Leu
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Lys Ala  Glu Thr Ser Glu Val  Ala Pro Ser Gly Val  Leu Ser Leu
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Leu Ala  Leu Ala Ala Gly Ala  Gly Ala Phe Ala Ala  Glu Leu Ala
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Cys Val  Thr Arg Gly Ala Val  Ala Thr Gly Arg Ser  Glu Gln Val
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Ala Asp  Pro Ala Gln Ala Leu  Val Trp Gly Leu Gly  Arg Val Ala
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Ser Met  Glu Gln Gly Gly Arg  Trp Gly Gly Leu Leu  Asp Leu Pro
    1130                1135                1140

Ala Asp  Leu Asp Gly Arg Thr  Leu Glu Arg Leu Ala  Gly Val Leu
    1145                1150                1155

Ala Gly  Asp Gly Ser Glu Asp  Gln Val Ala Leu Arg  Ala Ser Gly
    1160                1165                1170

Leu Phe  Gly Arg Arg Leu Val  His Ala Pro Leu Ala  Asp Thr Ala
    1175                1180                1185

Ala Val  Gln Glu Trp Arg Pro  Gln Gly Thr Thr Leu  Val Thr Gly
    1190                1195                1200

Gly Thr  Gly Ala Leu Gly Ala  His Val Ala Arg Trp  Leu Ala Gly
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Asn Gly  Ala Glu His Leu Leu  Leu Thr Ser Arg Arg  Gly Pro Asp
    1220                1225                1230

Ala Pro  Gly Ala Ala Ala Leu  Arg Asp Glu Leu Thr  Ala Leu Gly
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Thr Gln  Val Thr Ile Ala Ser  Cys Asp Met Ala Asp  Arg Asp Ala
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Val Thr  Ala Leu Ile Ala Ala  Ile Pro Ala Asp Gln  Pro Leu Thr
    1265                1270                1275

Ala Val  Ile His Ala Ala Ala  Val Val Asp Asp Gly  Val Ile Glu
    1280                1285                1290

Thr Leu  Ala Pro Glu Gln Val  Glu Ala Val Leu Arg  Val Lys Val
    1295                1300                1305

Asp Ala  Thr Leu Ile Leu His  Glu Leu Thr Arg Gly  Leu Asp Leu
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Ser Ala  Phe Val Leu Phe Ser  Ser Phe Ala Ala Thr  Phe Gly Ala
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Pro Gly  Gln Gly Asn Gln Ala  Pro Gly Asn Ala Tyr  Leu Asp Ala
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Phe Ala  Glu Tyr Arg Arg Gly  Ser Gly Leu Pro Ala  Thr Ser Ile
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Ala Trp  Gly Pro Trp Gly Ser  Ala Asp Gly Asp Asp  Ser Ala Ala
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Gly Asp  Arg Met Arg Arg His  Gly Ile Ile Val Met  Ser Pro Glu
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Ala Arg Arg Ile Ile Glu Ser Ala Glu Arg Glu Ser Ala Asp Asp
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Glu Leu Arg Asn Arg Leu Gly Ala Val Ser Gly Leu Lys Leu Pro
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Ala Ser Leu Val Phe Asp His Pro Thr Pro Ala Ala Val Ala Ala
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Phe Leu Arg Ala Gly Ile Val Pro Asp Ala Ala Ala Gly Gly Ala
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Pro Leu Leu Glu Glu Leu Asp Lys Leu Glu Ala Val Leu Glu Arg
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Gly Thr Ala Asp Asn Val Val Arg Ala Arg Val Thr Met Arg Leu
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1595 1600 1605

Ala Glu Val Trp Ala Ala Ala Ala Asn Gly Ser Gly Ser Gly Ile
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<212> PRT
<213> Streptomyces aizunensis

<400> 29

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Gln Asp Pro Ile Ala Ile Val Gly Met Gly Cys Arg Tyr Pro Gly Gly
35 40 45

Val Thr Ser Pro Glu Glu Leu Trp Gln Leu Val Val Asp Gly Gly Asp
50 55 60

Ala Ile Ser Gly Phe Pro Ala Asp Arg Gly Trp Asp Met Glu Thr Val
65 70 75 80

Tyr His Pro Asp Pro Glu His Pro Gly Thr Ser Tyr Ala Asn Gln Gly
85 90 95

```
Gly Phe Val Arg Asp Phe Ala Arg Phe Asp Pro Ser Leu Phe Gly Ile
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Ser Pro Arg Glu Ala Leu Ala Met Asp Pro Gln Gln Arg Leu Leu Leu
        115                 120                 125

Glu Thr Ser Trp Glu Ala Phe Glu Arg Ala Gly Ile Asp Pro Thr Ser
    130                 135                 140

Met Arg Gly Lys Gln Val Gly Val Phe Val Gly Thr Ser Asn His Asp
145                 150                 155                 160

Tyr Leu Ser Ala Leu Leu Ser Ser Ser Glu Asn Val Glu Gly Tyr Leu
                165                 170                 175

Gly Thr Gly Asn Ala Ala Ser Val Ala Ser Gly Arg Leu Ser Tyr Thr
            180                 185                 190

Phe Gly Leu Glu Gly Pro Ala Val Thr Val Asp Thr Ala Cys Ser Ser
        195                 200                 205

Ser Ser Val Ala Leu His Leu Ala Val Gln Ala Leu Arg Asn Gly Glu
    210                 215                 220

Cys Ser Leu Ala Leu Ala Gly Gly Ala Thr Leu Met Ser Ala Pro Gly
225                 230                 235                 240

Thr Phe Ile Asp Tyr Ser Lys Gln Arg Gly Leu Ala Thr Asp Gly Arg
                245                 250                 255

Cys Lys Ala Phe Ser Pro Asp Ala Asp Gly Phe Ser Leu Ala Glu Gly
            260                 265                 270

Val Gly Ile Leu Leu Val Glu Arg Leu Ser Asp Ala Arg Arg Lys Gly
        275                 280                 285

His Pro Val Leu Ala Val Val Arg Gly Thr Ala Val Asn Gln Asp Gly
    290                 295                 300

Ala Ser Asn Gly Leu Thr Ala Pro Asn Gly Pro Ser Gln Gln Arg Val
305                 310                 315                 320

Ile Leu Gln Ala Leu Ser Asn Ala Arg Leu Thr Pro Asp Gln Val Asp
                325                 330                 335

Ala Val Glu Ala His Gly Thr Gly Thr Gly Leu Gly Asp Pro Ile Glu
            340                 345                 350

Ala Gln Ala Leu Ile Ala Thr Tyr Gly Gln Asp Arg Pro Asp Gly Arg
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Pro Leu Trp Leu Gly Ser Leu Lys Thr Asn Ile Gly His Ala Gln Ala
    370                 375                 380

Ala Ala Gly Val Ala Gly Val Ile Lys Ser Val Met Ala Met Arg His
385                 390                 395                 400

Gly Val Leu Pro Arg Thr Leu His Val Asp Glu Pro Thr Pro Glu Val
                405                 410                 415

Asp Trp Ser Ala Gly Asp Val Ser Leu Leu Thr Glu Ala Arg Pro Trp
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Pro Leu Gly Asp Gln Pro Arg Arg Ile Gly Val Ser Ser Phe Gly Met
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Ser Gly Thr Asn Ala His Ile Ile Leu Glu Ser Ala Gln Glu Tyr Ala
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Asp Gly Arg Gln Ala Asp Ala Gly Thr Ala Gly Asn Glu Pro Ala Thr
465                 470                 475                 480

Gly Arg Thr Asn Pro Pro Gly Ala Leu Pro Val Val Leu Ser Gly Arg
                485                 490                 495

Thr Glu Pro Ala Leu Arg Ala Gln Ala Ala Ala Leu His Ala His Leu
            500                 505                 510

Ala Ala His Pro Gly Leu Gly Ile Ala Asp Leu Ala Phe Ser Gln Ala
        515                 520                 525

Leu Thr Arg Ala Ala Leu Asp Arg Arg Ala Ala Val Val Ala Asp Asp
    530                 535                 540

Arg Asp Ala Leu Leu Ala Gly Leu Ala Ala Leu Ala Glu Gly Arg Pro
545                 550                 555                 560

Ser Ala Asp Val Val Glu Gly Ser Ala Thr Asp Gly Lys Leu Ala Phe
                565                 570                 575

Leu Phe Thr Gly Gln Gly Ser Gln Arg Pro Gly Met Gly Arg Glu Leu
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Tyr Ala Thr Tyr Pro Val Phe Ala Gln Ala Leu Asp Ala Val Cys Glu
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Arg Leu Glu Leu Pro Leu Lys Asp Val Leu Phe Gly Thr Asp Gly Ala
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Ala Gly Ala Ala Leu Asp Glu Thr Ala Tyr Thr Gln Pro Ala Leu Phe
625                 630                 635                 640

Ala Val Glu Val Ala Leu Phe Arg Leu Val Glu Ser Trp Gly Leu Lys
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Pro Asp Tyr Leu Ala Gly His Ser Ile Gly Glu Ile Ala Ala Ala His
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Val Ala Gly Val Phe Ser Leu Glu Asp Ala Cys Thr Leu Val Glu Ala
        675                 680                 685

Arg Gly Arg Leu Met Gln Ala Leu Pro Thr Gly Gly Val Met Ile Ala
    690                 695                 700

Val Glu Ala Ser Glu Asp Glu Val Leu Pro Leu Leu Thr Asp Trp Val
705                 710                 715                 720

Ser Ile Ala Ala Val Asn Gly Pro Arg Ser Val Val Val Ala Gly Asp
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Glu Asp Ala Ala Val Ala Ile Ala Glu Ala Phe Ala Ala Gln Gly Arg
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Lys Thr Lys Lys Leu Thr Val Ser His Ala Phe His Ser Pro His Met
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Asp Gly Met Leu Asp Ala Phe Arg Thr Val Ala Gln Gly Leu Ser Tyr
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Thr Asp Glu Met Gly Ser Ala Asp Phe Trp Val Arg His Val Arg Glu
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Ala Val Arg Phe Leu Asp Gly Ile Arg Trp Leu Glu Ser Arg Gly Val
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Thr Thr Tyr Ile Glu Leu Gly Pro Gly Gly Val Leu Ser Ala Leu Gly
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Gln Asp Cys Gln Thr Ala Thr Gly Pro Arg Ala Ala Ala Phe Leu Pro
    850                 855                 860

Ala Leu Arg Thr Gly Arg Pro Glu Ala Ser Ser Leu Thr Ala Ala Val
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Ala Gly Ala His Val Arg Gly Leu Ser Pro Asp Trp Thr Val Arg Phe
                885                 890                 895

Ala Gly Thr Gly Ala Gln Arg Val Glu Leu Pro Thr Tyr Ala Phe Gln
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Arg Glu Leu Tyr Trp Pro Arg Asp Pro Phe Thr Asp Pro Ala Glu Ser
        915                 920                 925

Ala His Gly Gly Glu Leu Gly Ala Thr Asp Ala Lys Phe Trp Glu Val
    930                 935                 940

Val Asp Ser Glu Asp Leu Ala Ala Leu Ala Asp Thr Leu Gly Val Gly
945                 950                 955                 960

Gly Asp Glu Pro Leu Ser Ser Val Leu Pro Ala Leu Ser Ala Trp His
                965                 970                 975

Arg Arg His Arg Asp Arg Asp Thr Val Asp Gly Trp Arg Tyr Arg Val
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Thr Trp Lys Pro Leu Thr Asp Thr  Thr Pro Ala Ser Pro  Ser Gly His
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Trp Leu  Leu Val Val Pro Thr  Glu His Ala Asp Ala  Pro Trp Ala
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Val Ala  Ala Glu Arg Ala Leu  Thr Ala Arg Gly Val  Thr Val Ser
    1025                1030                1035

Thr Val  Val Leu Asp Ala Thr  Leu Asp Asp Arg Ala  Ala Thr Ala
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Arg Arg  Ile Gly Glu Ala Leu  Ala Ala Ser Ala Ala  Thr Asp Ser
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Ala Pro  Ala Gly Ala Glu Thr  Leu Ala Gly Val Phe  Ser Leu Leu
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Ala Leu  Glu Glu Arg Pro His  Pro Ala Asp Pro Ala  Leu Ser Ala
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Gly Val Glu Ala Pro Leu Trp Ala Ala Thr Cys Gly Ala Val Ser
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Gly Arg Leu Ala Asp Val Leu Gly Gly Leu Gly Gly Pro Gly Ala
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Glu Asp His Leu Ala Val Arg Ser Thr Gly Val Phe Val Arg Arg
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Leu Ala Arg Ala Thr Arg Asp Glu Arg Pro Thr Thr Glu Trp Ala
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Thr Thr Gly Thr Ala Leu Ile Thr Gly Gly Thr Gly Ala Leu Gly
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Arg His Val Ala Arg Trp Leu Ala Arg Thr Gly Ala Gln His Leu
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Leu Leu Val Ser Arg Arg Gly Pro Glu Ala Glu Gly Ala Asp Ala
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Leu Ala Ala Glu Leu Arg Ala Leu Gly Ala Glu Val Thr Ile Ala
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Ala Cys Asp Val Ala Asp Arg Asp Ala Val Ala Ala Leu Leu Ala
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Gly Val Leu Asp Asp Gly Val Leu Asp Ala Gln Thr Pro Gln Arg
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Leu Ala Gly Val Leu Arg Pro Lys Ala His Ala Ala Gln Val Leu
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His Glu Leu Thr Arg Asp Leu Asp Leu Ser Ala Phe Val Leu Phe
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Ser Ser Val Ala Ala Val Phe Gly Ala Ala Gly Gln Ala Asn Tyr
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Glu Gly Gly Met Ala Thr Asp Glu Leu Val Ala Glu Arg Leu Arg
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Leu His Arg Ala Leu Thr Leu Asp Glu Thr Ala Ser Leu Val Ala
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Asp Ile Asp Trp Glu Arg Leu Ala Pro Gly Leu Thr Ala Val Arg
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Pro Cys Pro Leu Ile Ala Asp Leu Pro Glu Ala Val His Ala Leu
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Tyr Ala Gly Pro Glu Ser Val Asp Pro Gly Ser Ala Phe Arg Asp
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Trp Glu Ala Phe Glu Arg Ala Gly Ile Asp Pro Ala Thr Val Arg
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Ser Thr Pro Ala Ser Phe Ile Asp Phe Ser Arg Gln Arg Gly Leu
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Ala Glu Asp Gly Arg Ile Lys Ala Phe Ala Ala Ala Ala Asp Gly
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Thr Gly Trp Gly Glu Gly Val Gly Ile Leu Leu Val Glu Arg Leu
1835 1840 1845

Ser Asp Ala Gln Arg Asn Gly His Pro Val Leu Ala Ile Val Arg
1850 1855 1860

Gly Ser Ala Ile Asn Gln Asp Gly Ala Ser Asn Gly Leu Thr Ala
1865 1870 1875

Pro Asn Gly Pro Ser Gln Gln Arg Val Ile Arg Gln Ala Leu Ala
1880 1885 1890

Ser Gly Gly Leu Thr Thr Met Asp Val Asp Ala Val Glu Ala His
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Gly Thr Gly Thr Lys Leu Gly Asp Pro Ile Glu Ala Gln Ala Leu
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Leu Ala Thr Tyr Gly Gln Asp Arg Pro Glu Gly Arg Pro Leu Leu
1925 1930 1935

Leu Gly Ser Ile Lys Ser Asn Leu Gly His Thr Gln Ala Ala Ala
1940 1945 1950

Gly Val Ala Gly Val Met Lys Met Val Leu Ala Met Gln His Gly
1955 1960 1965

Val Leu Pro Gln Thr Leu His Val Asp Glu Pro Thr Pro His Val
1970 1975 1980

Asp Trp Ser Ala Gly Asp Val Ala Leu Leu Ala Asp Ala Val Ala
1985 1990 1995

Trp Pro Glu Thr Gly Arg Pro Arg Arg Ala Gly Val Ser Ser Phe
2000 2005 2010

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Gly Arg Ser Ala Phe Glu Arg Arg Ala Ala Val Ile Ala Ala Asp
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Pro Glu Gly Ala Glu Gly Glu Ala Gly Arg Phe Gly Leu His Pro
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Ala Leu Leu Asp Ala Ala Leu His Ala Ile Gly Leu Gly Gly Leu
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Gly Ala Asp Asp Gly Gln Gly Arg Leu Pro Phe Ala Trp Ser Gly
2705 2710 2715

Val Ser Leu His Ala Gly Gly Ala Ala Ala Leu Arg Val His Leu
2720 2725 2730

Ala Pro Ala Gly Ala Glu Gly Val Arg Leu Glu Ile Ala Asp Ala
2735 2740 2745

Ser Gly Ala Pro Val Ala Ala Val Glu Ser Leu Gly Leu Arg Pro
2750 2755 2760

Val Thr Ala Glu Gln Leu Arg Ala Ala Arg Ala Thr Tyr His Glu
2765 2770 2775

Ser Val Phe Arg Gln Gln Trp Thr Glu Leu Pro Gly Leu Gly Ala
2780 2785 2790

Pro Ala Ala Thr Pro Ala Val Arg Tyr Ala Phe Leu Gly Gly Asp
2795 2800 2805

Ser Gly Asp Ser Gly Asp Ser Gly Asp Thr Ala Ala Ala Asp Arg
2810 2815 2820

His Gln Asp Leu Ala Ala Leu Ala Ala Ala Ile Asp Ala Gly Arg
2825 2830 2835

Pro Val Pro Asp Glu Val Val Val Glu Leu Ala Ala Ala Pro Trp
2840 2845 2850

Ala Val Ser Ala Ser Ala Val His Ser Ala Ala His Asp Ala Leu
2855 2860 2865

Ala Leu Ile Gln Thr Trp Leu Ala Asp Asp Arg Phe Ala Ala Ala
2870 2875 2880

Arg Leu Val Phe Leu Thr Arg Gly Ala Val Ala Ala Asp Ala Gly
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Asp Asp Val Thr Asp Leu Ala Ala Ala Thr Val Trp Gly Leu Leu
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Arg Ser Ala Gln Thr Glu Asn Pro Gly Arg Ile Ala Leu Val Asp
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Thr Asp Gly His Asp Arg Ser Glu Gln Ala Leu Arg Ala Ala Leu
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Thr Ser Asp Glu Glu Arg Phe Ala Leu Arg Ala Gly Ala Val Leu
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Val Pro Arg Leu Ala Arg Val Glu Ile Gln Gln Asp Asp Ser Ala
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Arg Thr Pro Ala Leu Thr Pro Gly Gly Thr Val Leu Ile Thr Gly
2975 2980 2985

Ala Thr Gly Ala Leu Gly Gly Leu Phe Ala Arg His Leu Ala Ala
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Glu His Gly Val Glu Arg Leu Leu Leu Val Gly Arg Arg Gly Ala
3005 3010 3015

Asp Ala Pro Gly Ala Ala Glu Leu Val Ala Glu Leu Ala Glu Ser
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Gly Thr Leu Ala Thr Trp Ala Ala Cys Asp Val Ala Asp Arg Asp
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Ala Leu Ala Ala Leu Leu Ala Asp Ile Pro Ala Glu His Pro Leu
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Thr Ala Val Val His Thr Ala Gly Val Leu Asp Asp Gly Val Ile
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Ser Ser Leu Thr Pro Glu Arg Leu Ser Ala Val Leu Arg Pro Lys
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Val Asp Ala Ala Trp Asn Leu His Glu Leu Thr Arg Gly Leu Asp
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Leu Ala Ala Phe Val Leu Phe Ser Ser Thr Ser Gly Leu Phe Gly
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Gly Pro Gly Gln Gly Asn Tyr Ala Ala Ala Asn Ser Phe Leu Asp
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Ala Leu Ala Gln His Arg Arg Ala His Gly Leu Pro Ala Thr Ser
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Thr Ala Trp Gly Leu Trp Ser Val Ala Asp Gly Met Ala Gly Ala
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Leu Asp Ala Ala Asp Val Asn Arg Met Arg Arg Ala Gly Leu Pro
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Pro Leu Thr Ala Ala Asp Gly Leu Gly Leu Phe Asp Thr Ala Val
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Ser Leu Asp Glu Ala Ser Leu Ala Leu Met Arg Val Asp Thr Glu
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Val Leu Arg Thr Gln Ala Gly Ala Gly Thr Ile Ala Pro Leu Leu
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Arg Gly Leu Val Arg Gly Val Ala Arg Arg Ser Val Asp Val Ser
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Ala Gly Ala Gly Gly Ala Glu Ser Glu Leu Arg Gly Arg Leu Ala
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Ala Leu Thr Ala Ala Glu Gln Asp Arg Ala Leu Leu Asp Leu Val
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Arg Thr Gln Val Ala Ala Val Leu Gly His Ala Gly Pro Ala Ala
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Val Glu Ser Gly Arg Ala Phe Lys Glu Leu Gly Phe Asp Ser Leu
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Arg Leu  Pro Ala Thr Leu Ile  Phe Asp Tyr Pro Asp  Pro Thr Val
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Leu Ala  Arg Tyr Leu Arg Gly  Glu Leu Ile Gly Asp  Asp Thr Thr
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Asp Ala  Val Ala Glu Pro Leu  Thr Ala Val Ala Asp  Asp Glu Pro
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Ile Ala  Ile Val Ala Met Ser  Cys Arg Tyr Pro Gly  Asp Val Arg
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Thr Pro  Glu Asp Leu Trp Gln  Leu Leu Thr Ala Gly  Ala Asp Gly
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Ile Thr  Arg Leu Pro Glu Asn  Arg Gly Trp Asp Thr  Glu Gly Leu
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Tyr Asp  Pro Asp Pro Glu Ser  Gln Gly Thr Ser Tyr  Ala Arg Asp
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Gly Gly  Phe Leu His Asp Ala  Ala Glu Phe Asp Ala  Ser Phe Phe
    3425                 3430                 3435

Gly Ile  Ser Pro Arg Glu Ala  Leu Ala Met Asp Pro  Gln Gln Arg
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Leu Leu  Leu Glu Thr Thr Trp  Glu Val Phe Glu Arg  Ala Gly Ile
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Ala Pro  Ser Ala Val Arg Gly  Ser Arg Thr Gly Val  Phe Ala Gly
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Val Met  Tyr His Asp Tyr Gly  Ala Arg Leu His Ala  Val Pro Asp
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Gly Val  Glu Gly Tyr Leu Gly  Thr Gly Ser Ser Ser  Ser Ile Val
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Ser Gly  Arg Val Ala Tyr Thr  Phe Gly Leu Glu Gly  Pro Ala Val
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Thr Val  Asp Thr Ala Cys Ser  Ser Ser Leu Val Ala  Leu His Leu
    3530                 3535                 3540

Ala Ala  Gln Ala Leu Arg Asn  Gly Glu Cys Ser Leu  Ala Leu Ala
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Gly Gly  Val Thr Val Met Phe  Thr Pro Gly Thr Phe  Ile Glu Phe
    3560                 3565                 3570

Ser Arg  Gln Arg Gly Leu Ala  Ala Asp Gly Arg Cys  Lys Ser Phe
    3575                 3580                 3585

Ala Ala  Ala Ala Asp Gly Thr  Gly Trp Gly Glu Gly  Ala Gly Met
    3590                 3595                 3600

Leu Leu  Leu Glu Arg Leu Ser  Asp Ala Arg Arg Asn  Gly His Gln
    3605                 3610                 3615
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Val Leu  Ala Val Val Arg Gly  Ser Ala Val Asn Gln  Asp Gly Ala
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Ser Asn  Gly Leu Thr Ala Pro  Asn Gly Pro Ser Gln  Gln Arg Val
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Ile Arg  Gln Ala Leu Ala Asn  Ala Gly Val Ala Ala  Gly His Val
    3650                 3655                 3660

Asp Ala  Val Glu Ala His Gly  Thr Gly Thr Thr Leu  Gly Asp Pro
    3665                 3670                 3675

Ile Glu  Ala Gln Ala Leu Leu  Ala Thr Tyr Gly Gln  Glu His Thr
    3680                 3685                 3690

Asp Asp  Arg Pro Leu Leu Leu  Gly Ser Val Lys Ser  Asn Leu Gly
    3695                 3700                 3705

His Thr  Gln Ala Ala Ser Gly  Val Ala Gly Val Ile  Lys Met Val
    3710                 3715                 3720

Met Ser  Met Arg His Gly Val  Leu Pro Lys Thr Leu  His Val Asp
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Glu Pro  Thr Pro His Val Asp  Trp Ser Ala Gly Ala  Val Ser Leu
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Leu Thr  Glu Gln Thr Pro Trp  Pro Glu Thr Gly Arg  Pro Arg Arg
    3755                 3760                 3765

Ala Gly  Val Ser Ser Phe Gly  Ile Ser Gly Thr Asn  Ala His Ala
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Ile Ile  Glu Gln Ala Pro Glu  Pro Asp Pro Ala Arg  Ala Lys Ala
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Thr Ala  Arg Pro Ala Pro Asp  Ala Ala Ala Pro Ser  Ser Val Pro
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Leu Ile  Val Ser Ala Arg Gly  Glu Asp Ala Leu Arg  Ala Gln Ala
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Arg Arg  Leu His Ala His Val  His Ala Asp Pro Gly  Leu Arg Ala
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Val Asp  Leu Gly Leu Ser Leu  Ala Thr Thr Arg Ser  Ala Leu Glu
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Gln Arg  Ala Ala Leu Val Ala  Gly Asp Arg Ala Glu  Leu Leu Arg
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Gly Leu  Asp Ala Leu Ala Arg  Gly Glu Asp Thr Ala  Gly Leu Val
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Arg Gly  Thr Ala Arg Glu Gly  Gln Val Ala Phe Leu  Phe Thr Gly
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Gln Gly  Ser Gln Arg Pro Gly  Met Gly Arg Glu Leu  Tyr Asp Ala
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His Pro  Val Phe Ala Asp Ala  Leu Asp Glu Ile Cys  Gly Glu Leu
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Glu Gly Asp Leu Ile His Gln Thr Ala Tyr Thr Gln Pro Ala Leu
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Phe Ala Val Glu Val Ala Leu Phe Arg Leu Leu Glu Ser Arg Gly
3965 3970 3975

Val Gln Pro Asp Phe Leu Ala Gly His Ser Ile Gly Glu Ile Ala
3980 3985 3990

Ala Ala His Val Ala Gly Val Phe Ser Leu Gln Asp Ala Ser Glu
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Leu Val Ala Ala Arg Gly Arg Leu Met Gln Ala Leu Pro Thr Gly
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Gly Val Met Ile Ala Val Gln Ala Ser Glu Asp Glu Val Leu Pro
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Leu Leu Thr Asp Arg Val Ser Ile Ala Ala Ile Asn Gly Pro Gln
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Ser Val Val Ile Ala Gly Asp Glu Ala Asp Ala Val Ala Ile Ala
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Glu Ser Phe Thr Asp Arg Lys Ser Lys Arg Leu Thr Val Ser His
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Ala Phe His Ser Pro His Met Asp Gly Met Leu Ala Asp Phe Arg
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Lys Val Ala Glu Gly Leu Val Tyr Glu Asn Pro Arg Ile Pro Val
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Val Ser Asn Leu Thr Gly Ala Leu Val Thr Asp Glu Met Gly Ser
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Ala Asp Phe Trp Val Arg His Val Arg Glu Ala Val Arg Phe Leu
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Asp Gly Ile Arg Ala Leu Glu Ala Ala Gly Val Thr Thr His Ile
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Glu Leu Gly Pro Asp Gly Val Leu Cys Ala Met Ala Gln Glu Cys
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Val Ser Gly Glu Asp Thr Val Phe Val Pro Val Leu Arg Pro Gly
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Arg Pro Glu Ala Glu Thr Val Thr Thr Ala Leu Ala Arg Val His
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Val Gln Gly Val Pro Val Asp Trp Gln Ala Tyr Phe Ser Gly Thr
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Gly Ala Gln Arg Val Asp Leu Pro Thr Tyr Ala Phe Gln Arg Lys
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Arg Tyr Trp Leu Asp Val Gly Val Ser Val Glu Asp Val Leu Ala
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Ala Gly Leu Asp Ala Ala Asp His Pro Leu Leu Gly Ala Thr Val
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Ser Leu Pro Gly Ser Asp Gly Leu Val Leu Thr Gly Arg Leu Ala
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Leu Ser Thr His Pro Trp Leu Ser Asp His Thr Val Met Asp Thr
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Val Leu Leu Pro Gly Thr Ala Phe Val Glu Leu Ala Leu Arg Ala
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Gly Glu Leu Val Gly Cys Gly Ala Val Glu Glu Leu Ala Leu Glu
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Ala Pro Leu Thr Leu Ala Asp Gln Gly Ala Val Gln Phe Gln Leu
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Ala Val Asp Ala Pro Asp Gly Ala Gly Arg Arg Thr Leu Thr Leu
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His Ser Arg Arg Ala Gly Ala Pro Ala Glu Glu Pro Trp Thr Arg
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His Ala Thr Gly Val Leu Thr Pro Glu Ala Ser Ala Val Pro Ala
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His Pro Phe Asp Leu Thr Ala Trp Pro Pro Ala Asp Ala Glu Pro
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Val Pro Thr Asp Ala Phe Tyr Pro Gly Ala Ala Ala Ala Gly Leu
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Gly Tyr Gly Pro Val Phe Gln Gly Leu Arg Ala Ala Trp Arg Arg
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Gly Asp Glu Leu Phe Ala Glu Val Ala Leu Asp Glu Glu His Glu
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Ala Asp Ala Ala Ala Tyr Gly Leu His Pro Ala Leu Leu Asp Ala
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Ala Leu His Ala Ile Gly Leu Gly Ala Pro Gly Ala Pro Ala Asp
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Ala Pro Ala Glu Gly Ala Arg Leu Pro Phe Ala Trp Thr Gly Val
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Arg Leu Tyr Ala Ala Gly Ala Ala Gly Ile Arg Val Arg Leu Thr
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Ala Ala Ala Ser Gly Gly Ile Ala Leu Asp Val Ala Asp Ser Thr
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Gly Ala Pro Val Ala Ser Val Glu Ser Leu Ile Leu Arg Pro Val
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Ser Ala Glu Gln Leu Gly Gly Asp Arg Thr Ala His His Glu Ser
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Leu Phe Gly Val Glu Trp Thr Arg Leu Ser Leu Pro Thr Gly Ala
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Ile Pro Ser Gly Glu Arg Trp Ala Val Leu Gly Glu Asp Glu Pro
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Asp Leu Arg Val Gly Gly Glu Arg Leu Asp Val Tyr Ser Gly Leu
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Thr Ala Leu Arg Glu Glu Ile Ala Ala Gly Thr Ser Ala Pro Asp
4595 4600 4605

Val Val Val Val Pro Leu Ser Ser Ala Ala Ser Gly Gly Gly Arg
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Ala Gly Thr Ala Arg Ala Ala Ala His His Ala Leu Ala Leu Val
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Lys Glu Trp Leu Ala Asp Glu Arg Leu Asp Gly Ala Arg Leu Val
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Leu Leu Thr Arg Gly Ala Val Ala Ala Val Pro Asp Glu His Val
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Thr Asp Leu Thr His Ala Pro Val Trp Gly Leu Val Arg Ser Ala
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Gln Ser Glu Asn Pro Gly Arg Phe Val Leu Ala Asp Thr Asp Gly
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Ala Asp Ala Ser Phe Gly Ala Leu Ala Ala Ala Leu Ala Thr Asp
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Glu Pro Gln Leu Ala Leu Arg Ser Gly Glu Ala His Ala Phe Arg
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Leu Arg Arg Ile Ala Arg Thr Ala Ser Asp Pro Ala Gly Glu Thr
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Gly Thr Gly Asp Gly Pro Thr Arg Ala Asp Asp Ala Gly Arg Ile
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Ala Ala Asp Gly Thr Val Leu Val Thr Gly Ala Ser Gly Thr Leu
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Gly Gly Leu Phe Ala Arg His Leu Ala Thr Thr His Gly Ala Arg
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His Leu Leu Leu Leu Ser Arg Arg Gly Asp Arg Ala Pro Gly Ala
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Gly Glu Leu Thr Arg Glu Leu Thr Glu Ala Gly Val Asp Val Thr
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Trp Ala Ala Cys Asp Ala Ala Asp Arg Asp Ala Leu Ala Ala Val
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Leu Ala Ala Ile Pro Ala Asp Arg Pro Leu Thr Ala Val Val His
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Thr Ala Gly Val Leu Asp Asp Gly Ile Ile Asp Ser Leu Thr Pro
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Glu Arg Leu Asp Thr Val Leu Arg Pro Lys Val Asp Ala Ala Trp
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Leu Phe Ser Ser Val Ala Gly Cys Phe Gly Ala Ala Gly Gln Gly
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Asn Tyr Ala Ala Ala Asn Thr Phe Leu Asp Ala Leu Ala Gln His
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Arg Lys Ala Arg Gly Leu Thr Ala Ser Ser Leu Ala Trp Gly Leu
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Trp Glu Thr Thr Asp Gly Met Ala Gly Ala Leu Asp Glu Ala Asp
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Leu Thr Arg Met Ala Arg Ser Gly Val Ala Ala Leu Ala Pro Asp
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Glu Gly Leu Ala Leu Phe Asp Thr Ser Arg Thr Leu Asp Asp Ala
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Val Leu Val Pro Met Arg Ile Glu Leu Gly Ala Leu Arg Ala Gln
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Ala Ala Asp Gly Thr Leu Pro Pro Leu Leu Arg Gly Leu Val Arg
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Thr Pro Ala Arg Arg Ala Ala Gly Ser Thr Ala Arg Ala Gly Thr
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Arg Pro Gly Thr Asp Pro Ala Gly Thr Leu Glu Glu Arg Leu Ala
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Gly Leu Ser Ala Ala Glu Arg Asp Arg Ala Leu Met Glu Leu Val
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Arg Thr Gln Val Ala Ala Val Leu Gly Tyr Ala Gly Pro Asp Asp
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Val Asp Ala Ala Arg Gly Phe Leu Asp Leu Gly Phe Asp Ser Leu
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Thr Ala Val Asp Leu Arg Asn Arg Leu Thr Ala Ser Ala Gly Leu
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Arg Leu Pro Val Thr Leu Ile Phe Asp Tyr Pro Ser Pro Thr Ala
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Leu Ala Ala Tyr Leu Ala Glu Arg Leu Gly Gln Gly Asp Pro Ser
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Arg Arg Pro Val His Ala Glu Leu Asp Lys Leu Glu Ser Ile Leu
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Ser Thr Val Gly Pro Asp Asp Val Glu Arg Ala Gly Ile Thr Ala
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Arg Leu Arg Asp Leu Leu Ala Lys Trp Asn Glu Thr His Ser Ala
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Gln Asp Ser Ala Ala Asp Glu Arg Glu Ile Gln Ser Ala Thr Ala
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35 40 45

Ile Asp Thr Pro Glu Lys Leu Trp Asp Leu Val Ala His Gly Arg Asp
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Phe Asp Pro Asp Pro Glu Thr Gly Ile Glu Ala Tyr Glu Gln Val Gly
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Gly Phe Leu His Asp Ala Ala Asp Phe Asp Pro Ala Phe Phe Gly Ile
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Leu Gly Leu Glu Gly Pro Ala Val Thr Val Asp Thr Ala Cys Ser Ser
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His Phe Val Glu Leu Gly Pro Asp Ala Val Leu Ser Ala Met Ala Gln
        835                 840                 845

Asp Cys Pro Ser Ala Asp Thr Ala Ala Phe Val Pro Val Leu Arg Lys
    850                 855                 860

Gly Arg Ser Glu Thr Gly Ser Leu Thr Asp Ala Leu Ala Arg Leu His
865                 870                 875                 880

Val Gly Gly Val Ala Val Asp Trp Asp Ala Tyr Tyr Ser Gly Thr Asp
                885                 890                 895

Val Gln Arg Val Asp Leu Pro Thr Tyr Ala Phe Gln Arg Ala His Tyr
            900                 905                 910

Trp Leu Asp Ala Gly Arg Pro Leu Gly Asp Val Ser Ser Ala Gly Leu
        915                 920                 925

Gly Ala Ala Gly His Pro Leu Leu Gly Ala Ala Val Ala Leu Ala Asp
    930                 935                 940

Leu Asp Gly Phe Leu Tyr Thr Gly Arg Leu Ser Leu Asp Thr His Pro
945                 950                 955                 960

Trp Leu Ala Asp His Ala Val Met Gly Ser Ala Val Leu Pro Gly Thr
                965                 970                 975

Ala Phe Val Glu Leu Ala Ile Arg Ala Gly Asp Gln Val Gly Cys Asp
            980                 985                 990

Leu Leu Glu Glu Leu Thr Leu His  Ala Pro Leu Val Leu  Pro Pro Ala
        995                 1000                1005

Gly Gly  Val Gln Val Gln Leu  Trp Val Gly Ala Pro  Asp Ala Thr
    1010                1015                1020

Gly Arg  Arg Thr Leu Gly Val  His Ser Arg Pro Glu  Pro Ala Pro
    1025                1030                1035

Asp Ala  Val Gly Pro Asp Ala  Asp Ala Ala Glu Pro  Trp Thr Arg
    1040                1045                1050

His Ala  Asp Gly Val Leu Ala  Thr Gly Ala Pro Gln  Pro Ser Phe
    1055                1060                1065

Ala Pro  Asp Val Trp Pro Pro  Ala Gly Ala Arg Pro  Leu Pro Val
    1070                1075                1080

Asp Glu  Leu Tyr Ala Gly Leu  Ala Glu Ala Gly Leu  Glu Tyr Gly
    1085                1090                1095

Pro Ala  Phe Gln Gly Val Arg  Ala Ala Trp Ala Ser  Asp Asp Ala
    1100                1105                1110

Ala Tyr  Val Glu Ile Ala Ala  Ala Asp Gly Gln Trp  Ala Asp Ala
    1115                1120                1125

Pro Leu  Phe Gly Leu His Pro  Ala Leu Leu Asp Ser  Ala Leu His
    1130                1135                1140
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Ala Ile Gly Leu Ala Gly Leu Val Glu Asp Thr Gly Arg Gly Arg
1145 1150 1155

Leu Pro Phe Ser Trp Ser Gly Val Ser Leu Tyr Ala Val Gly Ala
1160 1165 1170

Ser Val Leu Arg Val Arg Leu Ala Lys Ala Gly Pro Asp Ala Val
1175 1180 1185

Ser Leu Ala Leu Ala Asp Gly Ala Gly Gln Pro Val Gly Asp Ile
1190 1195 1200

Ala Ser Leu Thr Leu Arg Pro Val Ser Ala Glu Gln Leu Asp Thr
1205 1210 1215

Gly Arg Gly Gly His His Asp Ala Leu Phe Gln Val Asp Trp Thr
1220 1225 1230

Pro Leu Asn Leu Pro Arg Ala Val Asp Ser Arg Trp Ala Val Leu
1235 1240 1245

Gly Glu Pro Val Pro Thr Asp Glu Pro Gly Asp Gly Val Ala Arg
1250 1255 1260

His Ala Asp Ala Glu Ala Leu Ser Ala Ala Leu Asp Ala Gly Ala
1265 1270 1275

Pro Val Pro Asp Ala Val Leu Val Arg His Pro Ala Leu Pro Glu
1280 1285 1290

Pro Thr Pro Glu Ala Val His Gln Ala Ala His Arg Thr Leu Gly
1295 1300 1305

Leu Leu Arg His Trp Leu Gly Asp Asp Arg Leu Ala Asp Ser Arg
1310 1315 1320

Leu Val Leu Leu Thr His Gly Ala Val Ala Ala Gly Asp Ala Asp
1325 1330 1335

Gln Val Pro Asp Pro Val His Ala Val Val Trp Gly Leu Val Arg
1340 1345 1350

Ser Ala Gln Ser Glu His Pro Gly Arg Phe Leu Leu Ile Asp Ser
1355 1360 1365

Asp Ser Gly Ile Asp Thr Leu Ser Trp Pro Thr Phe Gly Ala Val
1370 1375 1380

Leu Ala Ser Glu Glu Pro Gln Val Ala Leu Arg Gly Gly Val Ala
1385 1390 1395

His Ala Pro Arg Leu Ala Lys Val Pro Ala Thr Ala Thr Ala Ala
1400 1405 1410

Ala Val Val Glu Thr Ser Ser Tyr Asp Pro Asp Gly Thr Val Leu
1415 1420 1425

Val Thr Gly Ala Ser Gly Thr Leu Gly Gly Leu Val Ala Arg His
1430 1435 1440

Leu Val Thr Gly Arg Gly Val Arg Arg Leu Leu Leu Leu Ser Arg
1445 1450 1455

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Arg Gly  Ala Asp Ala Pro Gly  Ala Gly Glu Leu Ala  Ala Glu Leu
    1460                 1465                 1470

Thr Gly  Leu Gly Ala Glu Val  Ser Trp Ala Ala Cys  Asp Ala Gly
    1475                 1480                 1485

Asp Arg  Asp Ala Leu Ala Ala  Val Leu Ala Ala Val  Pro Ala Ala
    1490                 1495                 1500

His Pro  Leu Thr Ala Val Val  His Thr Ala Gly Val  Leu Asp Asp
    1505                 1510                 1515

Gly Val  Ile Gly Ser Leu Thr  Pro Glu Arg Leu Asp  Thr Val Leu
    1520                 1525                 1530

Arg Pro  Lys Ala Asp Ala Ala  Leu His Leu His Glu  Leu Thr Arg
    1535                 1540                 1545

Asp Leu  Pro Leu Thr Ala Phe  Val Leu Phe Ser Ser  Ala Ala Gly
    1550                 1555                 1560

Val Phe  Gly Ala Pro Gly Gln  Gly Asn Tyr Ala Ala  Ala Asn Ser
    1565                 1570                 1575

Phe Leu  Asp Ala Leu Ala Gln  Tyr Arg Arg Ala His  Gly Leu Pro
    1580                 1585                 1590

Gly Arg  Ser Leu Ala Trp Gly  Leu Trp Glu Asp Ala  Glu Gly Met
    1595                 1600                 1605

Ala Gly  Ala Leu Asp Arg Ala  Asp Leu Asp Arg Met  Lys Arg Gly
    1610                 1615                 1620

Gly Val  His Gly Leu Thr Ala  Ser Glu Gly Leu Ala  Leu Leu Asp
    1625                 1630                 1635

Leu Ala  Asp Ala Leu Gly Ala  Asp Arg Asp Asp Gln  Gly Gln Asp
    1640                 1645                 1650

Gln Glu  Thr Ala Gly Arg Ala  Leu Leu Val Pro Met  Arg Leu Thr
    1655                 1660                 1665

Leu Pro  Ala Val Ala Pro Gly  Ala Glu Val Ala Pro  Leu Phe Arg
    1670                 1675                 1680

Gly Leu  Val Arg Thr Pro Ala  Arg Arg Val Ala Ala  Gly Ala Thr
    1685                 1690                 1695

Thr Gly  Ala Thr Thr Gly Thr  Gly Pro Asp Leu Ser  Ala Leu Glu
    1700                 1705                 1710

Arg Arg  Leu Leu Gly Leu Asp  Ala Pro Glu Arg Glu  Arg Leu Leu
    1715                 1720                 1725

Leu Asp  Leu Val Arg Gly His  Val Ala Asp Val Leu  Gly His Gly
    1730                 1735                 1740

Ser Pro  Asp Ala Ile Asp Pro  Glu Gln Ala Phe Ser  Glu Leu Gly
    1745                 1750                 1755

Phe Asp  Ser Leu Thr Ala Val  Glu Leu Arg Asn Arg  Leu Gly Ala
    1760                 1765                 1770
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Ala Ile  Gly Arg Arg Leu Pro  Ala Thr Leu Ile Phe  Asp His Pro
    1775                 1780                 1785

Ala Ser  Leu Thr Leu Ala Arg  His Leu Ser Gly Glu  Leu Ala Gly
    1790                 1795                 1800

Ser Gln  Ala Ala Leu Ala Pro  Ala Gly Pro Ala Pro  Thr Val Thr
    1805                 1810                 1815

Asp Asp  Asp Pro Ile Ala Ile  Val Ala Met Ser Cys  Arg Tyr Pro
    1820                 1825                 1830

Gly Gly  Val Thr Thr Pro Glu  Glu Leu Trp Gln Leu  Leu Ala Gly
    1835                 1840                 1845

Gly Gly  Asp Ala Ile Ser Gly  Phe Pro Ala Asp Arg  Gly Trp Asp
    1850                 1855                 1860

Val Glu  Ser Leu Tyr Asp Pro  Asp Pro Asp His Pro  Gly Thr Ser
    1865                 1870                 1875

Tyr Thr  Arg His Gly Gly Phe  Leu Arg Asp Ala Ala  Ala Phe Asp
    1880                 1885                 1890

Pro Thr  Phe Phe Gly Ile Ser  Pro Arg Glu Ala Val  Gly Thr Asp
    1895                 1900                 1905

Pro Gln  Gln Arg Leu Leu Leu  Glu Thr Thr Trp Glu  Ala Phe Glu
    1910                 1915                 1920

Arg Ala  Gly Ile Asp Pro Ala  Thr Val Arg Gly Ser  Arg Thr Gly
    1925                 1930                 1935

Val Phe  Ala Gly Val Met Tyr  His Asp Tyr Ala Ala  Leu Leu Glu
    1940                 1945                 1950

Arg Ser  Lys Asp Gly Ala Asp  Gly Ser Leu Gly Ser  Gly Ser Thr
    1955                 1960                 1965

Gly Ser  Ile Ala Ser Gly Arg  Val Ser Tyr Thr Phe  Gly Leu Glu
    1970                 1975                 1980

Gly Pro  Ala Val Thr Ile Asp  Thr Ala Cys Ser Ser  Ser Leu Val
    1985                 1990                 1995

Ala Leu  His Met Ala Ile Gln  Ala Leu Arg Thr Gly  Glu Cys Asp
    2000                 2005                 2010

Met Ala  Leu Ala Gly Gly Val  Thr Val Met Ala Thr  Pro Gly Thr
    2015                 2020                 2025

Phe Ile  Gly Phe Ser Arg Gln  Arg Gly Leu Ser Ala  Asp Gly Arg
    2030                 2035                 2040

Cys Arg  Ala Phe Ser Ala Asp  Ala Asp Gly Thr Gly  Trp Gly Glu
    2045                 2050                 2055

Gly Val  Gly Met Leu Leu Val  Glu Arg Leu Ser Asp  Ala Arg Arg
    2060                 2065                 2070

Asn Gly  His Pro Val Leu Ala  Val Val Arg Gly Ser  Ala Ile Asn
    2075                 2080                 2085
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Gln Asp Gly Ala Ser Asn Gly Leu Thr Ala Pro Asn Gly Pro Ser
2090 2095 2100

Gln Gln Arg Val Ile Arg Ala Ala Leu Ala Ser Ala Gly Leu Ser
2105 2110 2115

Ala Ala Glu Val Asp Ala Val Glu Ala His Gly Thr Gly Thr Thr
2120 2125 2130

Leu Gly Asp Pro Ile Glu Ala Gln Ala Leu Leu Ala Thr Tyr Gly
2135 2140 2145

Arg Glu His Thr Glu Asp Ser Pro Leu Trp Leu Gly Ser Ile Lys
2150 2155 2160

Ser Asn Met Gly His Thr Gln Ala Ala Ala Gly Val Ala Gly Val
2165 2170 2175

Ile Lys Met Val Leu Ala Ile Gln His Gly Val Leu Pro Arg Thr
2180 2185 2190

Leu His Ala Asp Arg Pro Ser Pro His Val Asp Trp Ser Gln Gly
2195 2200 2205

Ala Val Ser Leu Leu Thr Glu Ser Val Pro Trp Pro Glu Thr Gly
2210 2215 2220

Arg Pro Arg Arg Ala Gly Val Ser Ser Phe Gly Ile Ser Gly Thr
2225 2230 2235

Asn Ala His Thr Ile Ile Glu Gln Ala Pro Glu Glu Ala Thr Val
2240 2245 2250

Ala Pro Ala Asp Ala Val Ala Ala Pro Ser Ala Leu Pro Leu Gln
2255 2260 2265

Leu Ala Gly Arg Ser Ala Glu Ala Leu Ser Ala Gln Ala Arg Ala
2270 2275 2280

Leu Ser Ala His Leu Thr Ala His Pro Asp Val Pro Leu Ala Asp
2285 2290 2295

Leu Ala Tyr Ser Leu Ala Thr Ser Arg Ala Thr Phe Asp His Arg
2300 2305 2310

Ala Val Leu Val Ala Thr Glu Gly Thr Thr Ala Ala Thr Ala Val
2315 2320 2325

Thr Ala Leu Asp Ala Leu Ala Asp Arg Arg Thr Ala Pro Gly Leu
2330 2335 2340

Val Arg Gly Thr Ala Ser Lys Gly Gly Arg Thr Ala Phe Leu Phe
2345 2350 2355

Thr Gly Gln Gly Ser Gln Arg Leu Gly Met Gly Arg Glu Leu Tyr
2360 2365 2370

Glu Ala His Pro Val Phe Ala Arg Ala Leu Asp Ala Val Cys Asp
2375 2380 2385

Arg Leu Glu Leu Pro Leu Lys Asp Val Leu Phe Gly Thr Asp Ala
2390 2395 2400

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Gly Leu  Leu Asn Glu Thr Val  Tyr Thr Gln Pro Gly  Leu Phe Ala
    2405                 2410                 2415

Val Glu  Val Ala Leu Phe Arg  Leu Leu Glu Ser Trp  Gly Val Lys
    2420                 2425                 2430

Pro Asp  Phe Leu Ala Gly His  Ser Ile Gly Glu Ile  Ala Ala Ala
    2435                 2440                 2445

His Val  Ala Gly Val Leu Ser  Leu Asp Asp Val Cys  Ala Leu Val
    2450                 2455                 2460

Glu Ala  Arg Gly Arg Leu Met  Gly Ala Leu Pro Gly  Gly Gly Val
    2465                 2470                 2475

Met Ile  Ala Val Gln Ala Ser  Glu Ala Glu Val Leu  Pro Leu Leu
    2480                 2485                 2490

Thr Asp  Arg Val Ser Ile Ala  Ala Ile Asn Gly Pro  Arg Ser Val
    2495                 2500                 2505

Val Ile  Ala Gly Asp Glu Ala  Asp Ala Val Ala Ile  Val Glu Ser
    2510                 2515                 2520

Phe Thr  Asp Arg Lys Ser Lys  Arg Leu Thr Val Ser  His Ala Phe
    2525                 2530                 2535

His Ser  Pro His Met Asp Gly  Met Leu Asp Ala Phe  Arg Glu Ile
    2540                 2545                 2550

Ala Glu  Gly Leu Ser Tyr Glu  Ala Pro Arg Ile Pro  Val Val Ser
    2555                 2560                 2565

Asn Leu  Thr Gly Ala Leu Val  Ser Asp Glu Met Gly  Ser Ala Asp
    2570                 2575                 2580

Phe Trp  Val Arg His Val Arg  Glu Ala Val Arg Phe  Leu Asp Gly
    2585                 2590                 2595

Ile His  Ala Leu Glu Ala Ala  Gly Val Thr Thr Tyr  Val Glu Leu
    2600                 2605                 2610

Gly Pro  Asp Gly Val Leu Ser  Ala Met Ala Gln Glu  Cys Val Thr
    2615                 2620                 2625

Gly Glu  Asp Ser Val Phe Val  Pro Val Leu Arg Ser  Gly Arg Pro
    2630                 2635                 2640

Glu Ala  Glu Ser Val Thr Thr  Ala Leu Ala Gln Ala  His Val Arg
    2645                 2650                 2655

Gly Ile  Ala Val Asp Trp Gln  Ala Tyr Phe Ala Gly  Thr Ser Ala
    2660                 2665                 2670

Gln Arg  Val Asp Leu Pro Thr  Tyr Arg Phe Gln Arg  Glu His Tyr
    2675                 2680                 2685

Trp Pro  Glu Thr Gly Ile Pro  Leu Pro Gly Asp Thr  Ala Gly Leu
    2690                 2695                 2700

Gly Leu  Ala Ala Ala Gly His  Pro Leu Leu Gly Ala  Ala Val Thr
    2705                 2710                 2715
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Leu Ala  Asp Ala Asp Gly Cys  Val Leu Thr Gly Arg  Leu Ser Leu
    2720                 2725                 2730

Arg Thr  His Pro Trp Leu Ala  Asp His Ala Val Met  Gly Ser Val
    2735                 2740                 2745

Leu Leu  Pro Gly Thr Ala Leu  Val Glu Leu Ala Leu  His Ala Gly
    2750                 2755                 2760

Glu Arg  Val Gly Thr Arg Ala  Leu Asp Glu Leu Thr  Leu Gln Ala
    2765                 2770                 2775

Pro Leu  Ile Leu Pro Asn Glu  Gly Ala Val Gln Leu  Gln Val Val
    2780                 2785                 2790

Val Gly  Ala Pro Asp Ala Ala  Gly His Arg Thr Val  Ala Val Tyr
    2795                 2800                 2805

Ser Arg  Pro Asp Ala Asp Gly  Glu Ala Trp Val Arg  His Ala Asp
    2810                 2815                 2820

Gly Leu  Leu Val Asp Glu Val  Arg Gly Ala Ala Ala  Asp Leu Gly
    2825                 2830                 2835

Val Trp  Pro Pro Ala Gly Ala  Thr Ala Val Pro Val  Asp Asp Ala
    2840                 2845                 2850

Tyr Ala  Ile Leu Glu Thr Ser  Gly Leu Ala Tyr Gly  Pro Leu Phe
    2855                 2860                 2865

Gln Gly  Leu Arg Ala Ala Trp  Arg Arg Ala Gly Glu  Leu Phe Ala
    2870                 2875                 2880

Glu Leu  Ala Leu Pro Thr Glu  Ala Gln Ala Asp Ala  Ala Ala Phe
    2885                 2890                 2895

Gly Leu  His Pro Ala Leu Leu  Asp Ser Ala Leu His  Thr Leu Ala
    2900                 2905                 2910

Leu Gly  Asp Leu Leu Ser Gly  Ala Asp Ala Glu Glu  Thr Pro Gly
    2915                 2920                 2925

Ala Ala  Arg Leu Pro Phe Ala  Trp Arg Gly Val Arg  Leu His Ala
    2930                 2935                 2940

Ala Gly  Ala Pro Ala Val Arg  Val Arg Leu Ala Glu  Ala Gly Gln
    2945                 2950                 2955

Gly Ala  Val Ser Leu Glu Leu  Ala Asp Ser Ala Gly  Ala Pro Val
    2960                 2965                 2970

Ala Ser  Val Asp Ser Leu Val  Leu Arg Ala Met Ser  Pro Glu Gln
    2975                 2980                 2985

Leu Gly  Ala Ala Ser Ala Gly  Arg Gln Glu Ser Leu  Phe Gln Ile
    2990                 2995                 3000

Asp Trp  Val Glu Pro Ala Ala  Asp Arg Thr Ala Ala  Ala Thr Asp
    3005                 3010                 3015

Val Glu  Arg Ala Leu Val Gly  Pro Glu Leu Arg Gly  Leu Asp Ala
    3020                 3025                 3030
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Thr Pro Tyr Ala Asp Leu Ala Ala Leu Ala Ala Ala Asp Ser Asp
3035 3040 3045

Val Pro Glu Leu Val Phe Ile Thr Thr Arg Ala Glu Ser Glu Pro
3050 3055 3060

Glu Gly Leu Pro Gly Thr Val His Val Arg Ala Val Asp Ala Leu
3065 3070 3075

Thr His Val Arg Ala Trp Leu Ala Glu Glu Arg Phe Ala Ser Ala
3080 3085 3090

Arg Leu Val Phe Val Thr Arg Gly Ala Met Thr Val Gly Ser Asp
3095 3100 3105

Glu Ala Val Arg Asp Leu Ala Gly Ala Ala Val Trp Gly Leu Val
3110 3115 3120

Arg Ser Ala Gly Thr Glu His Pro Gly Arg Phe Ala Leu Val Asp
3125 3130 3135

Leu Asp Asp Asp Asp Val Leu Pro Glu Gln Thr Val Leu Thr Ala
3140 3145 3150

Leu Ala Ala Gly Glu Ser Glu Leu Val Val Arg Glu Gly Ser Leu
3155 3160 3165

Leu Val Pro Arg Leu Ala Arg Ala Ala Val Val Glu Gly Ser Gly
3170 3175 3180

Arg Glu Leu Asp Val Asp Gly Thr Val Leu Val Thr Gly Ala Ser
3185 3190 3195

Gly Thr Leu Gly Gly Leu Phe Ala Arg His Leu Val Val Glu Arg
3200 3205 3210

Gly Val Arg Arg Leu Leu Leu Val Ser Arg Arg Gly Gly Ala Ala
3215 3220 3225

Glu Gly Ala Ala Glu Leu Gly Ala Glu Leu Thr Glu Leu Gly Ala
3230 3235 3240

Asp Val Arg Trp Ala Ala Cys Asp Val Ala Asp Arg Glu Ala Leu
3245 3250 3255

Glu Ser Val Leu Ala Gly Ile Pro Ala Glu Tyr Pro Leu Ser Gly
3260 3265 3270

Val Val His Thr Ala Gly Val Leu Asp Asp Gly Val Val Ser Ser
3275 3280 3285

Leu Thr Ala Glu Arg Val Ser Ala Val Leu Arg Pro Lys Val Asp
3290 3295 3300

Ala Ala Trp Asn Leu His Glu Leu Thr Arg Gly Leu Asp Leu Ser
3305 3310 3315

Leu Phe Val Leu Phe Ser Ser Ala Ala Gly Val Phe Gly Gly Ala
3320 3325 3330

Gly Gln Ala Asn Tyr Ala Ala Ala Asn Val Phe Leu Asp Ala Leu
3335 3340 3345

Ala Gln His Arg Arg Ala Gln Gly Leu Ala Ala Thr Ser Leu Ala
3350 3355 3360

Trp Gly Leu Trp Ala Glu Pro Gly Gly Met Ala Gly Ala Leu Asp
3365 3370 3375

Ala Asp Asp Val Ser Arg Leu Gly Arg Gly Gly Val Ser Gly Leu
3380 3385 3390

Ser Ala Gly Glu Gly Val Ala Leu Phe Asp Ala Ala Ser Ala Ser
3395 3400 3405

Glu Gln Ala Leu Phe Val Pro Val Lys Leu Asp Leu Ala Ala Leu
3410 3415 3420

Arg Ala Gln Ala Gly Ser Gly Met Leu Pro Pro Leu Leu Ser Gly
3425 3430 3435

Leu Val Arg Thr Pro Thr Arg Arg Ala Ala Gly Thr Ala Asn Ala
3440 3445 3450

Ala Val Ser Ala Pro Gly Asp Arg Leu Ala Gly Leu Ser Ala Ala
3455 3460 3465

Glu Gln Val Ala His Val Leu Glu Leu Val Arg Thr Gln Val Ala
3470 3475 3480

Ala Val Leu Gly Tyr Ala Ser Pro Glu Ala Val Glu Lys Asp Ser
3485 3490 3495

Ser Phe Arg Glu Leu Gly Phe Asp Ser Leu Thr Ala Val Glu Leu
3500 3505 3510

Arg Asn Leu Leu Gly Ala Ala Thr Gly Leu Arg Leu Pro Ala Thr
3515 3520 3525

Leu Val Phe Asp Tyr Pro Thr Ser Ala Val Leu Ala Asp His Leu
3530 3535 3540

Arg Ser Glu Leu Val Gly Thr Ala Pro Val Thr Ser Ala Pro Val
3545 3550 3555

Val Leu Ala Ala Arg Asp Asp Asp Glu Pro Ile Ala Ile Val Gly
3560 3565 3570

Leu Gly Cys Arg Tyr Pro Gly Gly Val Glu Ser Pro Asp Asp Leu
3575 3580 3585

Trp Arg Leu Val Leu Glu Gly Arg Asp Ala Ile Thr Glu Phe Pro
3590 3595 3600

Glu Asp Arg Gly Trp Asp Val Asp Ala Leu Phe Asp Ala Asp Pro
3605 3610 3615

Asp Gln Gln Gly Thr Ser Tyr Ala Arg Glu Gly Gly Phe Val Arg
3620 3625 3630

Asp Ala Gly His Phe Asp Pro Ala Phe Phe Gly Ile Ser Pro Arg
3635 3640 3645

Glu Ala Val Ala Met Asp Pro Gln Gln Arg Leu Leu Leu Glu Thr
3650 3655 3660

Ser Trp Glu Ala Phe Glu Arg Ala Gly Ile Asp Pro Ala Ala Leu
3665 3670 3675

Arg Gly Ser Arg Thr Gly Val Phe Ala Gly Val Met Tyr His Asp
3680 3685 3690

Tyr Ala Ser Arg Leu Thr Ala Leu Pro Glu Gly Val Glu Gly Phe
3695 3700 3705

Leu Gly Thr Gly Asn Ala Ala Ser Val Ile Ser Gly Arg Leu Ser
3710 3715 3720

Tyr Ala Phe Gly Leu Glu Gly Pro Ala Ile Thr Val Asp Thr Ala
3725 3730 3735

Cys Ser Ser Ser Leu Val Ala Leu His Leu Ala Val Gln Ala Leu
3740 3745 3750

Arg Asn Gly Glu Cys Ser Leu Ala Leu Ala Gly Gly Val Thr Val
3755 3760 3765

Met Ala Thr Pro Ala Ala Phe Val Glu Phe Ser Arg Gln Arg Gly
3770 3775 3780

Leu Ala Ala Asp Gly Arg Cys Lys Ala Phe Ser Ala Gly Ala Asp
3785 3790 3795

Gly Thr Gly Trp Ser Glu Gly Ala Gly Val Leu Leu Val Glu Arg
3800 3805 3810

Leu Ser Asp Ala Arg Arg Asn Gly His Pro Val Leu Ala Val Val
3815 3820 3825

Arg Gly Ser Ala Ile Asn Gln Asp Gly Ala Ser Asn Gly Leu Thr
3830 3835 3840

Ala Pro Asn Gly Pro Ser Gln Gln Arg Val Ile Arg Gln Ala Leu
3845 3850 3855

Ala Ser Ala Gly Leu Ser Ala Ala Asp Val Asp Val Val Glu Ala
3860 3865 3870

His Gly Thr Gly Thr Thr Leu Gly Asp Pro Ile Glu Ala Gln Ala
3875 3880 3885

Leu Leu Ala Thr Tyr Gly Gln Glu His Thr Asp Glu Gln Pro Leu
3890 3895 3900

Leu Leu Gly Ser Ile Lys Ser Asn Phe Gly His Thr Gln Ala Ala
3905 3910 3915

Ala Gly Val Ala Gly Ile Ile Lys Ile Val Gln Ala Met Arg His
3920 3925 3930

Gly Val Val Pro Lys Thr Leu His Val Asp Glu Pro Thr Pro His
3935 3940 3945

Val Asp Trp Ser Ala Gly Ala Val Ser Leu Leu Thr Glu Gln Val
3950 3955 3960

Ala Trp Pro Glu Thr Gly Arg Pro Arg Arg Ala Ala Ile Ser Ser
3965 3970 3975

Phe Gly Phe Ser Gly Thr Asn Ala His Ala Ile Ile Glu Gln Ala
3980 3985 3990

Pro Asp Pro Ala Pro Glu Asp Leu Pro Asp Ala Gly Pro Asp Val
3995 4000 4005

Arg Pro Glu Pro Ala Arg Thr Pro Gly Ser Leu Pro Trp Leu Leu
4010 4015 4020

Ser Ala Lys Gly Ala Asp Ala Leu Arg Asp Gln Ala Ala Arg Leu
4025 4030 4035

Arg Ala His Ala Ile Gly His Pro Glu Leu Ser Leu Ala Asp Ile
4040 4045 4050

Gly Tyr Ala Leu Ala Thr Ser Arg Thr Ala Leu Asp Arg Arg Ala
4055 4060 4065

Ala Val Val Ala Gly Asp Arg Glu Glu Phe Leu Ala Gly Leu Ala
4070 4075 4080

Ala Leu Ala Glu Gly Ala Thr Ala Ala Gly Leu Thr Glu Gly Ser
4085 4090 4095

Pro Ala Gly Gly Lys Leu Ala Phe Leu Phe Thr Gly Gln Gly Ser
4100 4105 4110

Gln Arg Leu Ala Met Gly Arg Glu Leu Tyr Ser Ala His Pro Val
4115 4120 4125

Phe Ala Arg Ala Leu Asp Ala Val Cys Asp Gly Leu Ala Leu Asp
4130 4135 4140

Val Pro Leu Lys Gln Val Leu Phe Gly Ser Asp Ala Asp Leu Leu
4145 4150 4155

Asp Arg Thr Ala Tyr Thr Gln Pro Ala Leu Phe Ala Val Glu Val
4160 4165 4170

Ala Leu Phe Arg Leu Val Glu Ser Trp Gly Leu Lys Pro Asp Phe
4175 4180 4185

Leu Ala Gly His Ser Ile Gly Glu Ile Thr Ala Ala His Val Ala
4190 4195 4200

Gly Val Leu Ser Leu Asp Asp Ala Cys Thr Leu Val Ala Ala Arg
4205 4210 4215

Gly Arg Leu Met Gln Ala Leu Pro Thr Gly Gly Val Met Ile Ala
4220 4225 4230

Val Glu Ala Ser Glu Asp Glu Val Leu Pro Leu Leu Thr Asp Arg
4235 4240 4245

Val Ser Ile Ala Ala Ile Asn Gly Pro Gln Ser Val Val Ile Ala
4250 4255 4260

Gly Asp Glu Ala Asp Ala Val Ala Ile Ala Glu Ser Phe Thr Gly
4265 4270 4275

Arg Lys Ser Lys Arg Leu Thr Val Ser His Ala Phe His Ser Pro
4280 4285 4290

His Met Asp Gly Met Leu Asp Ala Phe Arg Glu Val Ala Glu Gly
4295 4300 4305

Leu Ser Tyr Gly Thr Pro Leu Ile Pro Val Val Ser His Leu Thr
4310 4315 4320

Gly Thr Leu Val Thr Asp Glu Met Arg Ser Pro Asp Phe Trp Val
4325 4330 4335

Arg His Val Arg Glu Ala Val Arg Phe Leu Asp Gly Ile Arg Thr
4340 4345 4350

Leu Glu Asp Ala Gly Val Thr Thr Tyr Ile Glu Leu Gly Pro Gly
4355 4360 4365

Gly Val Leu Ser Ala Met Gly Gln Ser Cys Val Thr Arg Asp Asp
4370 4375 4380

Ala Ala Phe Leu Pro Ala Leu Arg Ala Asp Arg Ser Glu Glu Glu
4385 4390 4395

Thr Leu Thr Ser Ala Val Ala Arg Ala His Leu Arg Gly Ile Thr
4400 4405 4410

Val Asp Trp Asp Ala Tyr Tyr Ser Gly Thr Gly Ala Arg Arg Val
4415 4420 4425

Asp Leu Pro Thr Tyr Ala Phe Gln Arg Gln Arg Tyr Trp Leu Glu
4430 4435 4440

Ala Pro Ala His Ala Pro Gly Gly Asp Val Thr Ser Ala Gly Leu
4445 4450 4455

Gly Ser Ala Gly His Pro Leu Leu Gly Ala Ala Val Glu Leu Pro
4460 4465 4470

Asp Ser Asp Gly Phe Leu Phe Thr Gly Arg Leu Ser Leu Arg Thr
4475 4480 4485

His Pro Trp Leu Gly Asp His Arg Val Ala Gly Thr Val Leu Leu
4490 4495 4500

Pro Gly Ala Ala Leu Leu Glu Leu Ala Val Arg Ala Gly Asp His
4505 4510 4515

Ala Gly Cys Asp Leu Leu Glu Asp Leu Thr Leu Glu Ala Pro Leu
4520 4525 4530

Val Leu Pro Glu Ala Gly Gly Val Gln Leu Arg Leu Val Val Ala
4535 4540 4545

Glu Pro Asp Ala Ser Arg Arg Arg Val Phe His Ile Tyr Ser Arg
4550 4555 4560

Pro Glu Asp Ala Ala Phe Glu Glu Pro Trp Thr Arg His Ala Gly
4565 4570 4575

Gly Val Leu Ala Val Glu Gly Ala His Pro Ala Glu Ala Glu Ser
4580 4585 4590

Glu Trp Pro Pro Ala Gly Ala Val Pro Cys Pro Val Glu Asp Leu
4595 4600 4605

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Tyr Pro  Ser Leu Asp Ala Ile  Gly Leu Gly Tyr Gly  Pro Ala Phe
    4610                 4615                 4620

Arg Asn  Leu Leu Leu Ala Trp  Lys Arg Gly Asp Glu  Val Phe Ala
    4625                 4630                 4635

Glu Val  Ala Leu Gly Glu Asp  Arg Arg Thr Glu Gly  Ala Leu Tyr
    4640                 4645                 4650

Gly Leu  His Pro Ala Leu Leu  Asp Ala Ala Leu His  Ala Val Gly
    4655                 4660                 4665

Leu Gly  Asp Phe Phe Pro Asp  Gly Pro Glu Gly Ala  Arg Leu Pro
    4670                 4675                 4680

Phe Ser  Trp Asp Gly Val Arg  Leu His Ala Val Gly  Ala Ala Ala
    4685                 4690                 4695

Leu Arg  Val Arg Met Ala Pro  Ala Gly Gln Asp Ala  Val Thr Leu
    4700                 4705                 4710

Ala Val  Ser Asp Glu Thr Gly  Arg Pro Val Leu Thr  Val Asp Ser
    4715                 4720                 4725

Leu Val  Leu Arg Pro Leu Ala  Leu Asp Gly Pro Gly  Gly Leu Gly
    4730                 4735                 4740

Gly Ala  Gly Arg Gly Pro Gly  Ser Val Arg Asp Ala  Leu Phe Gln
    4745                 4750                 4755

Val Asp  Trp His Ala Leu Pro  Leu Pro Glu Ala Gln  Ser Pro Ala
    4760                 4765                 4770

Glu Gly  Arg Trp Ala Leu Leu  Gly Gly Asp Pro Leu  Lys Leu Ala
    4775                 4780                 4785

Ala Ala  Leu Glu Arg Thr Gly  Val Leu Glu Pro Gly  Ala Leu Phe
    4790                 4795                 4800

Gly Thr  Ala Ser Glu Asp Thr  Gly Gly His Pro Arg  Asp Leu Ser
    4805                 4810                 4815

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Leu Glu  Leu Ile Gln Ala Trp  Leu Ala Asp Glu Arg  Leu Ala Gly
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Asp Ala  Asp Val Asp Asp Leu  Ala His Ala Ala Val  Trp Gly Leu
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Gln Glu Pro Ile Ala Ile Val Ala Met Ser Cys Arg Tyr Pro Gly Gly
35 40 45

Val Arg Ser Pro Glu Asp Leu Trp Arg Leu Val Glu Asn Gly Asp Asp
50 55 60

Ala Val Ser Gly Phe Pro Val Asp Arg Gly Trp Asp Val Glu Ala Leu
65 70 75 80

Tyr Asp Ala Asp Pro Asp Ser Ser Gly Ser Ser Tyr Val Ser Glu Gly
85 90 95

Gly Phe Leu Tyr Asp Ala Ala Ser Phe Asp Pro Ala Pro Phe Gly Ile
100 105 110

Ser Pro Arg Glu Ala Leu Ala Met Asp Pro Gln Gln Arg Leu Leu Leu
115 120 125

Glu Ala Ser Trp Glu Ala Phe Glu Arg Ala Gly Ile Asp Pro Ser Ser
130 135 140

Val Arg Gly Ser Arg Thr Ala Val Phe Ala Gly Val Met Tyr His Asp
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Tyr Thr Ala Arg Leu Asp Ser Val Pro Glu Gly Val Glu Gly Phe Leu
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Gly Thr Gly Ser Ser Gly Ser Ile Ala Ser Gly Arg Val Ala Tyr Thr
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Phe Gly Leu Glu Gly Pro Ala Val Thr Val Asp Thr Ala Cys Ser Ser
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Cys Lys Pro Phe Ala Ala Ala Ala Asp Gly Thr Gly Trp Gly Glu Gly
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Ile His Gln Ala Leu Thr Asn Ala Arg Leu Ser Ala Ala Asp Val Asp
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740 745 750

Lys Arg Ile Ala Val Asp Tyr Ala Ser His Ser Ala Gln Val Glu Leu
755 760 765

Leu Arg Glu Glu Leu Ala Glu Leu Leu Ala Pro Ile Val Pro Arg Ala
770 775 780

Ala Glu Val Pro Phe Leu Ser Thr Val Thr Gly Glu Trp Val Arg Gly
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Pro Glu Leu Asp Ala Gly Tyr Trp Phe Gln Asn Leu Arg Arg Thr Val
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835 840 845

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Leu Thr Ala Leu Leu Pro Ala Leu Ser Ser Trp Arg Arg Gln Ser Arg
                965                 970                 975

Glu Arg Ser Ala Val Asp Gly Trp Arg Tyr Arg Val Thr Trp Lys Pro
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Ala Pro Glu Pro Thr Thr Ala Arg  Leu Ser Gly Thr Trp  Leu Val Ala
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Asp Val  Leu Ala Asp Gly Pro  Ala Val Ser Gly Val  Leu Ser Leu
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Phe Ser  Ser Phe Ala Ala Thr  Phe Gly Ala Pro Gly  Gln Gly Asn
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Tyr Ala  Pro Gly Asn Ala Phe  Leu Asp Ala Phe Ala  Glu Tyr Arg
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1865 1870 1875

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Thr Tyr Gly Gln Asp Arg Pro Ala Gly Arg Pro Leu Leu Leu Gly
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Ala Pro Asp Gly Arg Cys Lys Pro Phe Ala Asp Gly Ala Asp Gly Thr
            260                 265                 270

Gly Trp Gly Glu Gly Val Gly Met Leu Leu Val Glu Arg Leu Ser Asp
        275                 280                 285

Ala Arg Arg Asn Gly His Pro Val Leu Ala Leu Val Arg Gly Ser Ala
    290                 295                 300

Ile Asn Gln Asp Gly Ala Ser Asn Gly Leu Thr Ala Pro Asn Gly Pro
305                 310                 315                 320

Ser Gln Gln Arg Val Ile Arg Gln Ala Leu Thr Asn Ala Gly Leu Thr
                325                 330                 335

Pro Ala Gln Val Asp Val Val Glu Ala His Gly Thr Gly Thr Thr Leu
            340                 345                 350

Gly Asp Pro Ile Glu Ala Gln Ala Leu Leu Ala Thr Tyr Gly Gln Asn
        355                 360                 365

Arg Pro Glu Gly Arg Pro Leu Trp Leu Gly Ser Val Lys Ser Asn Ile
```

370 375 380

Gly His Thr Gln Ala Ala Ala Gly Val Ala Gly Ile Ile Lys Met Val
385 390 395 400

Leu Ala Met Gln His Gly Val Leu Pro Glu Ser Leu His Ile Asp Gln
405 410 415

Pro Ser Gly Asn Val Asp Trp Ala Ala Gly Asp Val Lys Leu Leu Thr
420 425 430

Glu Ala Val Pro Trp Pro Gln Thr Gly Gln Pro Arg Arg Ala Gly Val
435 440 445

Ser Ser Phe Gly Val Ser Gly Thr Asn Ala His Thr Val Ile Glu Gln
450 455 460

Ala Pro Pro Ala Asp Asp Ala Pro Glu Thr Gly Ala Asp Thr Ala Pro
465 470 475 480

Thr Ala Glu Ala Pro Glu Ala Ala Ser Ala Asp Ala Ser Glu Ala Gly
485 490 495

Thr Pro Thr Gly Ala Thr Gly Pro Val Pro Val Leu Val Ser Gly Gln
500 505 510

Ser Asp Ala Ala Leu Arg Ala Gln Ala Glu Arg Leu Ala Ala His Leu
515 520 525

Arg Ala His Pro Gly Leu Gly Ala Asp Thr Gly Thr Leu Thr Asp Leu
530 535 540

Gly Phe Ser Leu Ala Thr Ser Arg Ser Ser Leu Asp Arg Arg Ala Val
545 550 555 560

Leu Phe Gly Asp Arg Asp Ser Leu Leu Ala Asp Leu Ser Ala Leu Ala
565 570 575

Glu Gly Glu Gln Pro Ala Gly Pro Val Leu Gly Ala Val Gly Glu Gly
580 585 590

Lys Thr Ala Phe Leu Phe Thr Gly Gln Gly Ser Gln Arg Leu Gly Met
595 600 605

Gly Arg Glu Leu Tyr Ala Thr His Pro Gly Phe Ala Arg Ala Leu Asp
610 615 620

Glu Val Arg Ala Glu Leu Asp Gln His Leu Glu Arg Pro Leu Phe Asp
625 630 635 640

Val Leu Phe Ala Ala Glu Gly Thr Pro Glu Ala Asp Leu Leu Asp Glu
645 650 655

Thr Ala Tyr Thr Gln Ser Ala Leu Phe Ala Val Glu Val Ala Leu Phe
660 665 670

Arg Gln Leu Glu Gln Trp Gly Val Gly Ala Asp Phe Leu Ile Gly His
675 680 685

Ser Ile Gly Glu Leu Ala Ala Ala His Val Ser Gly Val Phe Thr Leu
690 695 700

Ala Asp Ala Ala Lys Leu Val Ala Ala Arg Gly Arg Leu Met Gln Ala

705 710 715 720

Leu Pro Ala Asp Gly Ala Met Ile Ala Val Glu Ala Thr Glu Asp Glu
725 730 735

Val Ala Pro Leu Leu Thr Gly Arg Val Ser Ile Ala Ala Val Asn Gly
740 745 750

Pro Arg Ser Val Val Val Ser Gly Asp Glu Asp Ala Ala Thr Ala Leu
755 760 765

Ala Glu Thr Leu Arg Ala Arg Gly Arg Arg Thr Lys Arg Leu Thr Val
770 775 780

Ser His Ala Phe His Ser Pro Leu Met Asp Gly Met Leu Asp Ala Phe
785 790 795 800

Arg Glu Val Ala Glu Ser Val Ala Tyr Ala Pro Pro Val Ile Pro Ile
805 810 815

Val Ser Asn Leu Thr Gly Ala Ser Val Thr Ala Glu Glu Ile Cys Ala
820 825 830

Ala Asp Tyr Trp Val Arg His Val Arg Glu Ala Val Arg Phe Leu Asp
835 840 845

Gly Val Arg Lys Leu Ser Ala Gln Gly Val Thr Thr Phe Val Glu Val
850 855 860

Gly Pro Gly Gly Val Leu Thr Ala Leu Ala Gln Glu Cys Val Thr Gly
865 870 875 880

Gln Asp Ala Val Phe Val Pro Val Leu Arg Gly Asp Arg Pro Glu Ala
885 890 895

Ala Ala Phe Ala Thr Ala Val Ala Gln Ala His Val His Gly Val Ala
900 905 910

Val Asp Trp Ser Ala Val Phe Ala Gly Arg Gly Ala Thr Arg Ile Asp
915 920 925

Leu Pro Thr Tyr Ala Phe Gln Arg Glu Leu Tyr Trp Pro Glu Gln Pro
930 935 940

Thr Ala Trp Ala Gly Asp Val Thr Ala Ala Gly Ile Gly Ala Ala Asp
945 950 955 960

His Pro Leu Leu Gly Ala Ala Ile Ala Leu Ala Asp Gly Asp Gly His
965 970 975

Leu Phe Thr Gly Arg Leu Ser Leu Ala Thr His Pro Trp Leu Ala Asp
980 985 990

His Thr Val Met Asp Thr Val Leu Leu Pro Gly Thr Ala Phe Val Glu
995 1000 1005

Leu Ala Leu Gln Ala Gly Asp His Thr Gly Cys Asp Leu Leu Asp
1010 1015 1020

Glu Leu Thr Leu Glu Ala Pro Leu Val Leu Pro Pro His Gly Gly
1025 1030 1035

Val Gln Ile Gln Leu Ala Val Gly Ala Pro Asp Ala Glu Gly Arg

1040 1045 1050

Arg Ser Leu Thr Leu His Ser Arg Pro Glu Asp Ala Ala Asp Asp
1055 1060 1065

Thr Trp Gly Glu Gly Ala Trp Thr Arg His Ala Thr Gly Phe Leu
1070 1075 1080

Ala Thr Ala Ala Gln Gly Ala Arg Glu Pro Leu Ala Asp Leu Thr
1085 1090 1095

Ser Trp Pro Pro Lys Asn Ala Thr Lys Val Asp Val Glu Gly Leu
1100 1105 1110

Tyr Ala Tyr Leu Thr Glu Ser Gly Phe Ala Tyr Gly Pro Val Phe
1115 1120 1125

Gln Gly Leu Thr Gly Ala Trp Gln Arg Gly Asp Glu Val Phe Ala
1130 1135 1140

Glu Val Arg Leu Pro Glu Gln Ala His Ala Glu Ala Ala Leu Phe
1145 1150 1155

Gly Leu His Pro Ala Leu Leu Asp Ala Ala Leu His Ala Val Gly
1160 1165 1170

Ile Gly Ser Leu Leu Glu Asp Thr Glu His Gly Arg Leu Pro Phe
1175 1180 1185

Ser Trp Ser Gly Val Ser Leu Arg Ala Val Gly Ala Arg Ala Leu
1190 1195 1200

Arg Val Arg Leu Ala Pro Ala Gly Asn Asp Thr Val Ser Val Thr
1205 1210 1215

Leu Ala Asp Glu Thr Gly Ala Pro Val Ala Ala Val Asp Ala Leu
1220 1225 1230

Leu Leu Arg Pro Val Ser Pro Asp Gln Val His Ala Ala Arg Thr
1235 1240 1245

Ala Phe His Asp Ser Leu Phe Arg Val Glu Trp Thr Gly Thr Pro
1250 1255 1260

Leu Pro Ala Ala Thr Thr Val Ala Ala Gly Gln Trp Ala Leu Leu
1265 1270 1275

Gly Glu Pro Arg Thr Glu Phe Thr Ala Ala Leu Pro Thr Ala Ala
1280 1285 1290

Thr His Ala Asp Leu Ala Ala Leu Gly Ala Ala Leu Asp Ala Gly
1295 1300 1305

Gly Pro Val Pro Arg Ala Val Ile Val Pro Phe Ser Ala Ser Gly
1310 1315 1320

Ala Pro Ser Ala Thr Pro Val Asp Ala Ala Leu Pro Thr Ala Val
1325 1330 1335

Ala Asp Ala Leu His Arg Thr Leu Glu Leu Ala Gln Ala Trp Leu
1340 1345 1350

Ala Asp Asp Arg Phe Ala Gly Ser Arg Leu Val Phe Val Thr Arg

1355 1360 1365

Asp Ala Val Ala Thr Thr Ala Gly Ser Asp Val Ala Asp Leu Ala
1370 1375 1380

His Ala Pro Leu Trp Gly Leu Leu Arg Ser Ala Gln Ser Glu His
1385 1390 1395

Pro Asp Arg Phe Val Leu Leu Asp Leu Asp Gly Arg Glu Asp Ser
1400 1405 1410

Leu Arg Ala Leu Pro Ala Ala Leu Ala Thr Ala Glu Pro Gln Leu
1415 1420 1425

Ala Leu Arg Ala Gly Lys Ala Leu Val Pro Arg Leu Ala Arg Val
1430 1435 1440

Ala Ala Ala Pro Gly Gln Glu Ala Pro Ala Leu Asp Pro Asp Gly
1445 1450 1455

Thr Ala Leu Val Thr Gly Ala Thr Gly Thr Leu Gly Gly Leu Val
1460 1465 1470

Ala Arg His Leu Val Ala Ala His Gly Val Arg His Leu Leu Leu
1475 1480 1485

Thr Ser Arg Arg Gly Glu Ala Ala Ala Gly Ala Ala Glu Leu Ala
1490 1495 1500

Ala Gly Leu Arg Glu Leu Gly Ala Glu Val Thr Ile Ala Ala Cys
1505 1510 1515

Asp Ala Ala Asp Arg Asp Ala Leu Ala Ala Leu Ile Gly Ser Val
1520 1525 1530

Pro Ala Glu His Pro Leu Thr Ala Val Val His Thr Ala Gly Val
1535 1540 1545

Leu Asp Asp Gly Val Leu Glu Ala Leu Thr Pro Glu Arg Ile Asp
1550 1555 1560

Ala Val Leu Pro Ala Lys Val Asp Ala Ala Val His Leu His Glu
1565 1570 1575

Leu Thr Arg Glu Leu Asp Leu Ala Ala Phe Val Leu Phe Ser Ala
1580 1585 1590

Ala Ala Gly Thr Leu Gly Gly Pro Gly Gln Ala Asn Tyr Ala Ala
1595 1600 1605

Ala Asn Thr Phe Leu Asp Ala Leu Ala His Arg Arg Arg Ala Glu
1610 1615 1620

Gly Leu Pro Ala Thr Ala Leu Ala Trp Gly Leu Trp Ala Glu Arg
1625 1630 1635

Ser Gly Met Thr Gly Asp Leu Ala Asp Ala Asp Leu Glu Arg Ile
1640 1645 1650

Ser Arg Ala Gly Val Ala Ala Leu Ser Ser Ala Glu Gly Leu Ala
1655 1660 1665

Leu Leu Asp Thr Ala Arg Ala Val Gly Asp Pro Thr Ala Val Pro

1670 1675 1680

Met His Leu Asp Leu Ala Ser Leu Arg His Ala Asp Ala Ser Met
1685 1690 1695

Val Pro Ala Leu Leu Arg Gly Leu Val Arg Ala Pro Ala Arg Arg
1700 1705 1710

Ser Val Glu Ser Pro Gly Ala Ala Pro Ala Gly Gly Leu Ala Glu
1715 1720 1725

Arg Leu Leu Pro Leu Thr Ala Ala Glu Arg Asp Arg Leu Leu Leu
1730 1735 1740

Asp Thr Val Arg Val Gln Val Ala Ala Val Leu Gly Tyr Pro Gly
1745 1750 1755

Pro Glu Ala Val Asp Pro Gly Arg Ala Phe Lys Glu Leu Gly Phe
1760 1765 1770

Asp Ser Leu Thr Ala Val Glu Leu Arg Asn Arg Leu Gly Ser Ala
1775 1780 1785

Thr Gly Val Arg Leu Pro Ala Thr Leu Val Phe Asp Tyr Pro Thr
1790 1795 1800

Pro Asn Ala Leu Ser Ala Phe Leu Arg Thr Glu Leu Leu Gly Asp
1805 1810 1815

Ala Ala Asp Ser Ala Pro Val Ala Ala Val Thr Ala Arg Asp Asp
1820 1825 1830

Glu Pro Ile Ala Ile Val Gly Met Ser Cys Arg Tyr Pro Gly Gly
1835 1840 1845

Val Thr Thr Pro Glu Glu Leu Trp Gln Leu Val Ala Gly Ser Val
1850 1855 1860

Asp Ala Ile Ser Pro Phe Pro Thr Asp Arg Gly Trp Asn Leu Asp
1865 1870 1875

Ala Leu Tyr Asp Ala Asp Pro Gly Arg Ala Gly Thr Ser Tyr Thr
1880 1885 1890

Arg Glu Gly Gly Phe Leu His Asp Ala Ala Asp Phe Asp Pro Asp
1895 1900 1905

Val Phe Gly Ile Asn Pro Arg Glu Ala Leu Ala Met Asp Pro His
1910 1915 1920

Gln Arg Leu Leu Leu Glu Thr Ser Trp Glu Ala Phe Glu Gln Ala
1925 1930 1935

Gly Ile Ala Pro Ser Ser Met Arg Gly Ser Arg Thr Gly Val Phe
1940 1945 1950

Ala Gly Val Met Tyr His Asp Tyr Leu Thr Arg Leu Pro Ala Val
1955 1960 1965

Pro Glu Gly Leu Glu Gly Tyr Leu Gly Thr Gly Thr Ala Gly Ser
1970 1975 1980

Val Ala Ser Gly Arg Ile Ser Tyr Thr Phe Gly Leu Glu Gly Pro

1985 1990 1995

Ala Val Thr Val Asp Thr Ala Cys Ser Ser Ser Leu Val Ala Leu
2000 2005 2010

His Leu Ala Ala Gln Ala Leu Arg Asn Gly Glu Cys Asp Met Ala
2015 2020 2025

Leu Ala Gly Gly Val Thr Val Met Ser Thr Pro Asp Thr Phe Ile
2030 2035 2040

Asp Phe Ser Arg Gln Arg Gly Leu Ser Gly Asn Gly Arg Cys Lys
2045 2050 2055

Ser Phe Ser Ala Asp Ala Asp Gly Thr Gly Trp Ala Glu Gly Ala
2060 2065 2070

Gly Met Ile Leu Val Glu Arg Leu Ser Asp Ala Arg Arg Asn Gly
2075 2080 2085

His Gln Val Leu Ala Val Val Arg Gly Thr Ala Val Asn Gln Asp
2090 2095 2100

Gly Ala Ser Asn Gly Leu Thr Ala Pro Asn Gly Pro Ser Gln Gln
2105 2110 2115

Arg Val Ile Arg Gln Ala Leu Ala Asn Ala Gly Leu Thr Thr Ala
2120 2125 2130

Glu Val Asp Val Val Glu Ala His Gly Thr Gly Thr Thr Leu Gly
2135 2140 2145

Asp Pro Ile Glu Ala Gln Ala Leu Leu Ala Thr Tyr Gly Gln Asp
2150 2155 2160

Arg Pro Ala Gly Gln Pro Leu Arg Leu Gly Ser Ile Lys Ser Asn
2165 2170 2175

Ile Gly His Thr Gln Ala Ala Ala Gly Ala Ala Gly Ile Ile Lys
2180 2185 2190

Met Ile Leu Ala Met Arg His Gly Val Met Pro Pro Ser Leu His
2195 2200 2205

Ile Gly Glu Pro Ser Pro His Ile Asp Trp Thr Ala Gly Ala Val
2210 2215 2220

Ser Leu Leu Thr Glu Ala Ala Glu Trp Pro Asp Ala Gly Arg Pro
2225 2230 2235

Arg Arg Ala Gly Ile Ser Ser Phe Gly Val Ser Gly Thr Asn Ala
2240 2245 2250

His Val Ile Ile Glu Gln Pro Pro Val Glu Glu Pro Ala Thr Ala
2255 2260 2265

Thr Glu Thr Gly Ser Gly Thr Gly Leu Pro Ala Gly Thr Pro Leu
2270 2275 2280

Pro Phe Ala Leu Ser Gly Arg Thr Pro Ala Ala Leu Arg Ala Gln
2285 2290 2295

Ala Ala Arg Leu Ile Gly His Leu Ala Pro Arg Pro Glu Ala Ala

2300 2305 2310

Pro Ala Asp Val Ala Leu Ser Leu Ala Thr Thr Arg Thr Ala Leu
2315 2320 2325

Asp Arg Arg Ala Ala Val Ile Ala His Asp Arg Thr Glu Leu Leu
2330 2335 2340

Ala Gly Leu Thr Ala Leu Ala Glu Gly His Asp Ser Ala Arg Leu
2345 2350 2355

Val Gln His Thr Ala Ala Asp Gly Arg Thr Ala Ile Leu Phe Thr
2360 2365 2370

Gly Gln Gly Ser Gln Arg Pro Gly Met Gly Arg Glu Leu Tyr Glu
2375 2380 2385

Thr Tyr Pro Ala Phe Ala Glu Ala Leu Asp Ala Val Cys Ala Glu
2390 2395 2400

Leu Asp Pro His Leu Glu Gln Pro Leu Lys Glu Val Leu Phe Thr
2405 2410 2415

Ala Asp Gly Asp Leu Leu Asn Arg Thr Gly Arg Thr Gln Pro Ala
2420 2425 2430

Leu Phe Ala Leu Glu Thr Ala Leu Tyr Arg Leu Val Glu Ser Trp
2435 2440 2445

Gly Val Arg Pro Asp Phe Val Ala Gly His Ser Ile Gly Glu Ile
2450 2455 2460

Thr Ala Ala His Val Ala Gly Val Leu Ser Leu Pro Asp Ala Ala
2465 2470 2475

Thr Leu Val Ala Ala Arg Gly Arg Leu Met Gln Glu Leu Pro Glu
2480 2485 2490

Gly Gly Ala Met Ile Ala Leu Thr Ala Thr Glu Asp Glu Val Leu
2495 2500 2505

Pro Leu Leu Ala Gly His Glu Asp Arg Ile Gly Ile Ala Ala Val
2510 2515 2520

Asn Ser Ala Ser Ser Val Val Ile Ser Gly Glu Glu Gly Leu Ala
2525 2530 2535

Leu Glu Ile Ala Ala Glu Phe Glu Arg Arg Gly Arg Arg Thr Lys
2540 2545 2550

Arg Leu Thr Val Ser His Ala Phe His Ser Pro Leu Met Asp Gly
2555 2560 2565

Met Leu Asp Ala Phe Arg Glu Val Ala Glu Ser Leu Thr Tyr Arg
2570 2575 2580

Ala Pro Ala Ile Pro Val Val Thr Leu Leu Thr Gly Thr Val Ala
2585 2590 2595

Gly Asp Glu Leu Arg Thr Ala Glu His Trp Val Ser His Val Arg
2600 2605 2610

Glu Ala Val Arg Phe Leu Asp Gly Ile Arg Thr Leu Asp Ala Glu

2615 2620 2625

His Val Thr Thr Tyr Leu Glu Leu Gly Pro Gln Gly Val Leu Ser
2630 2635 2640

Gly Leu Gly Arg Asp Cys Leu Thr Asp Pro Ala Asp Pro Ala Asp
2645 2650 2655

Thr Ala Val Phe Val Pro Ala Leu Arg Arg Asp Arg Gly Glu Ala
2660 2665 2670

Glu Ala Leu Thr Ala Ala Ile Ala Ala Ala His Thr Arg Gly Val
2675 2680 2685

Pro Leu Asp Trp Ser Ala Tyr Phe Ala Gly Thr Gly Ala Arg Arg
2690 2695 2700

Val Glu Leu Pro Thr Tyr Ala Phe Gln Arg Glu Arg Phe Trp Leu
2705 2710 2715

Glu Ala Pro Ala Gly Tyr Ile Gly Asp Val Glu Ser Ala Gly Met
2720 2725 2730

Gly Ala Ala His His Pro Leu Leu Gly Ala Ala Val Ala Leu Ala
2735 2740 2745

Asp Gly Glu Gly Phe Leu Phe Thr Gly Arg Leu Ser Leu Asp Thr
2750 2755 2760

His Pro Trp Leu Ala Asp His Ala Val Met Gly Asn Val Leu Leu
2765 2770 2775

Pro Gly Thr Ala Phe Val Glu Leu Ala Ile Arg Ala Gly Asp Gln
2780 2785 2790

Ala Gly Cys Asp Leu Leu Glu Glu Leu Thr Leu Glu Ala Pro Leu
2795 2800 2805

Ile Leu Ala Pro Gln Ala Ala Ala Arg Leu Gln Ile Val Val Gly
2810 2815 2820

Ala Pro Asp Gly Ser Gly Arg Arg Thr Leu Asp Val Tyr Ser Ser
2825 2830 2835

Asp Pro Asp Ala Pro Ala Asp Glu Pro Trp Thr Arg His Ala Gly
2840 2845 2850

Gly Ile Leu Ala Thr Gly Ala Gln Ala Pro Ala Phe Asp Leu Thr
2855 2860 2865

Ala Trp Pro Pro Pro Gly Ala Glu Ala Val Gly Val Asp Gly Leu
2870 2875 2880

Tyr Glu His Leu Gly Arg Gly Gly Phe Ala Tyr Gly Pro Val Phe
2885 2890 2895

Gln Gly Leu Arg Ala Ala Trp Leu Leu Gly Asp Asp Val Tyr Ala
2900 2905 2910

Glu Val Ala Leu Pro Asp Asp Arg Gln Ala Glu Ala Ala Arg Phe
2915 2920 2925

Gly Leu His Pro Ala Leu Leu Asp Ala Ala Leu His Ala Thr Phe

2930 2935 2940

Val Gln Pro Ser Pro Asp Gly Asp Gln Gln Gly Arg Leu Pro Phe
2945 2950 2955

Ser Trp Arg Asp Val Ser Leu His Ala Val Gly Ala Ser Ala Leu
2960 2965 2970

Arg Val Arg Leu Thr Pro Asp Gly Arg Asp Thr Leu Ser Leu Gln
2975 2980 2985

Leu Ala Asp Thr Thr Gly Ala Pro Val Ala Ala Val Gly His Leu
2990 2995 3000

Thr Leu Arg Pro Val Ser Ala Asp Gln Leu Gly Ser Ala Arg Ser
3005 3010 3015

Ala His His Glu Ser Leu Phe Arg Ile Asp Trp Ala Thr Val Pro
3020 3025 3030

Leu Pro Ser Asp Ala Pro Ala Ala Thr Asp Glu Trp Ala Val Ile
3035 3040 3045

Ala Ala Asp Gly Gly Thr Asp Gly Gly Thr Asp Gly Gly Thr Asp
3050 3055 3060

Gly Gly Ile Pro Ala Ala Leu Pro Gly Arg Val His Thr Gly Leu
3065 3070 3075

Asp Ala Leu Gly Ala Ala Val Asp Ala Gly Ala Pro Val Pro Ala
3080 3085 3090

His Val Leu Val His His Thr Pro Ala Ala Thr Thr Ala Asp Ala
3095 3100 3105

Val His Ala Ala Thr His Glu Ala Leu Arg Leu Val Arg Ala Trp
3110 3115 3120

Leu Ala Asp Asp Arg Phe Ala Ala Ser Arg Leu Val Phe Val Thr
3125 3130 3135

Arg Gly Ala Ile Ala Thr Gln Ser Asp Trp Asp Leu Thr Asp Leu
3140 3145 3150

Thr His Ala Pro Val Trp Gly Leu Val Arg Thr Ala Gln Ser Glu
3155 3160 3165

Asn Pro Asp Arg Phe Val Leu Ala Asp Leu Asp Ala Asp Pro Ala
3170 3175 3180

Ser Thr Asp Ala Leu Ala Ala Ala Leu Ala Thr Gly Glu Pro Gln
3185 3190 3195

Leu Ala Val Arg Arg Gly Thr Val His Ala Pro Arg Leu Ala Arg
3200 3205 3210

Val Pro Ala Ala Thr Pro Leu Thr Pro Pro Pro Gly Glu Ser Ala
3215 3220 3225

Trp Arg Met Asp Ile Glu Asp Lys Gly Thr Leu Asp His Leu Thr
3230 3235 3240

Leu Val Pro Ser Pro Glu Ser Ala Ala Pro Leu Glu Pro Gly Gln

3245 3250 3255

Val Arg Val Ala Val Arg Ala Ala Gly Leu Asn Phe Arg Asp Val
3260 3265 3270

Leu Asn Ala Leu Gly Met Tyr Pro Gly Asp Pro Gly Leu Met Gly
3275 3280 3285

Ser Glu Gly Ala Gly Ile Val Val Glu Thr Gly Pro Gly Val Thr
3290 3295 3300

Gly Leu Ala Pro Gly Asp Arg Val Met Gly Met Leu Pro Gly Ser
3305 3310 3315

Phe Gly Pro Leu Ala Val Val Asp Arg Arg Met Ile Ala Pro Met
3320 3325 3330

Pro Glu Gly Trp Thr Phe Ala Glu Ala Ala Ser Val Pro Ile Val
3335 3340 3345

Phe Met Thr Ala Tyr Tyr Ala Leu His Asp Leu Ala Gly Leu Gln
3350 3355 3360

Gly Gly Glu Ser Leu Leu Val His Ala Ala Ala Gly Gly Val Gly
3365 3370 3375

Met Ala Ala Val Gln Leu Ala Arg His Trp Gly Ala Asp Val Tyr
3380 3385 3390

Ala Thr Ala Ser Pro Ala Lys Trp Asp Thr Leu Arg Gly Leu Gly
3395 3400 3405

Leu Gly Asp Asp Arg Ile Ala Ser Ser Arg Thr Leu Asp Phe Glu
3410 3415 3420

Glu Thr Phe Arg Thr Ala Thr Gly Gly Arg Gly Val Asp Val Val
3425 3430 3435

Leu Asp Ser Leu Ala Arg Glu Phe Val Asp Ala Ser Leu Arg Leu
3440 3445 3450

Leu Pro Arg Gly Gly Arg Phe Val Glu Met Gly Lys Thr Asp Val
3455 3460 3465

Arg Ser Pro Gln Asp Val Ala Asp Ala His Pro Gly Val Ser Tyr
3470 3475 3480

Gln Ala Phe Asp Leu Thr Glu Ala Gly Leu Asp Arg Ile Gln Glu
3485 3490 3495

Met Leu Thr Glu Leu Leu Thr Leu Phe Arg Ser Gly Ala Leu Arg
3500 3505 3510

Pro Val Pro Val Ser Ala Trp Asp Leu Arg Gln Ala Pro Glu Ala
3515 3520 3525

Phe Arg Tyr Leu Ser Gln Ala Arg His Val Gly Lys Ile Val Leu
3530 3535 3540

Thr Leu Pro Gly Glu Trp Asn Ser Gln Gly Thr Val Leu Ile Thr
3545 3550 3555

Gly Gly Thr Gly Thr Leu Gly Ala Val Val Ala Arg His Ala Val

3560 3565 3570

Thr Thr Arg Gly Ala Arg Arg Leu Leu Leu Thr Ser Arg Arg Gly
3575 3580 3585

Glu Ala Ala Ala Gly Ala Ala Glu Leu Ala Ala Glu Leu Arg Glu
3590 3595 3600

Leu Gly Ala Glu Val Thr Ile Ala Ala Cys Asp Ala Ala Asp Arg
3605 3610 3615

Asp Ala Leu Ala Ala Leu Ile Glu Ser Ile Pro Ser Glu His Pro
3620 3625 3630

Leu Thr Ala Val Ile His Thr Ala Gly Val Leu Asp Asp Gly Val
3635 3640 3645

Val Asp Ser Leu Thr Pro Glu Arg Leu Ser Thr Val Leu Arg Pro
3650 3655 3660

Lys Val Asp Ala Ala Trp Asn Leu His Glu Leu Thr Arg His Leu
3665 3670 3675

Asp Leu Ala Asp Phe Val Leu Phe Ser Ser Ala Ala Gly Thr Phe
3680 3685 3690

Gly Gly Ala Gly Gln Ala Asn Tyr Ala Ala Ala Asn Val Phe Leu
3695 3700 3705

Asp Ala Leu Ala Arg His Arg His Ala His Gly Leu Ala Ala Thr
3710 3715 3720

Ser Leu Ala Trp Gly Leu Trp Ala Glu Ala Ser Gly Met Thr Gly
3725 3730 3735

Glu Leu Asp Thr Ala Asp Lys Asp Arg Met Thr Arg Ser Gly Val
3740 3745 3750

Leu Gly Leu Ser Ser Glu Glu Gly Val Ala Leu Leu Asp Thr Ala
3755 3760 3765

Arg Leu Thr Gly Asp Ala Leu Leu Val Pro Met His Leu Asp Leu
3770 3775 3780

Ala Pro Leu Arg Arg Thr Asp Ala Ser Met Val Pro Ala Leu Leu
3785 3790 3795

Arg Gly Leu Val Arg Ala Pro Ala Arg Arg Ala Val Gly Ala Thr
3800 3805 3810

Ala Ala Gly Ala Gly Thr Pro Leu Val Glu Arg Leu Val Arg Leu
3815 3820 3825

Pro Glu Asn Glu Arg Asp Pro Leu Leu Leu Asp Leu Val Arg Gln
3830 3835 3840

Gln Val Ala Ala Val Leu Gly His Ala Thr Pro Asp Ala Val Glu
3845 3850 3855

Pro Thr Arg Ala Phe Lys Asp Leu Gly Phe Asp Ser Leu Thr Ala
3860 3865 3870

Val Glu Phe Arg Asn Arg Leu Gly Ala Thr Ala Gly Ile Arg Leu

3875 3880 3885

Pro Ala Thr Leu Val Phe Asp Tyr Pro Thr Pro Thr Val Leu Ala
3890 3895 3900

Gly Tyr Leu Lys Asp Glu Leu Leu Gly Ser Glu Ala Ala Ala Ala
3905 3910 3915

Leu Pro Lys Leu Ala Ala Thr Ala Val Glu Gly Asp Asp Pro Ile
3920 3925 3930

Ala Ile Val Ala Met Ser Cys Arg Phe Pro Gly Asp Val Arg Thr
3935 3940 3945

Pro Glu Asp Leu Trp Glu Leu Leu Ala Glu Gly Arg Asp Gly Ile
3950 3955 3960

Ser Asp Leu Pro Asp Asp Arg Gly Trp Asp Thr Glu Ala Leu Tyr
3965 3970 3975

Asp Pro Asp Pro Asp Ser Pro Gly Thr Ser Tyr Ala Arg Glu Gly
3980 3985 3990

Gly Phe Phe Tyr Asp Ala His His Phe Asp Pro Ala Phe Phe Gly
3995 4000 4005

Ile Asn Pro Arg Glu Ala Leu Ala Met Asp Pro Gln Gln Arg Leu
4010 4015 4020

Leu Leu Glu Thr Ser Trp Glu Ala Phe Glu Arg Ala Gly Ile Asp
4025 4030 4035

Pro Thr Gly Leu Arg Gly Lys Gln Val Gly Val Phe Val Gly Gln
4040 4045 4050

Met His Asn Asp Tyr Val Ser Arg Leu Asn Thr Val Pro Glu Gly
4055 4060 4065

Val Glu Gly Tyr Leu Gly Thr Gly Gly Ser Ser Ser Ile Ala Ser
4070 4075 4080

Gly Arg Val Ser Tyr Thr Phe Asp Phe Glu Gly Pro Ala Val Thr
4085 4090 4095

Val Asp Thr Ala Cys Ser Ser Ser Leu Val Ala Leu His Leu Ala
4100 4105 4110

Ala Gln Ala Leu Arg Asn Gly Glu Cys Thr Leu Ala Leu Ala Gly
4115 4120 4125

Gly Val Thr Ile Ile Thr Thr Pro Asp Val Phe Thr Glu Phe Ser
4130 4135 4140

Arg Gln Arg Gly Leu Ala Ser Asp Gly Arg Cys Lys Pro Phe Ala
4145 4150 4155

Glu Ala Ala Asp Gly Thr Ala Trp Gly Glu Gly Val Gly Met Leu
4160 4165 4170

Leu Val Glu Arg Leu Ser Asp Ala Arg Arg Asn Gly His Gln Val
4175 4180 4185

Leu Ala Val Val Arg Gly Thr Ala Val Asn Gln Asp Gly Ala Ser

4190 4195 4200

Asn Gly Leu Thr Ala Pro Asn Gly Pro Ser Gln Gln Arg Val Ile
4205 4210 4215

Arg Gln Ala Leu Ala Asn Ala Gly Leu Thr Ala Ala Glu Val Asp
4220 4225 4230

Ala Val Glu Ala His Gly Thr Gly Thr Arg Leu Gly Asp Pro Ile
4235 4240 4245

Glu Ala Gln Ala Leu Leu Ala Thr Tyr Gly Gln Asp Arg Pro Glu
4250 4255 4260

Gly Ser Pro Leu Trp Leu Gly Ser Ile Lys Ser Asn Phe Gly His
4265 4270 4275

Thr Gln Ala Ala Ala Gly Val Ala Gly Ile Ile Lys Met Val Gln
4280 4285 4290

Ala Met His His Gly Val Leu Pro Lys Thr Leu His Val Asp Ala
4295 4300 4305

Pro Ser Pro His Val Asp Trp Ser Ala Gly Ala Val Ser Leu Leu
4310 4315 4320

Thr Glu Gln Met Ala Trp Pro Glu Thr Gly Arg Pro Arg Arg Ala
4325 4330 4335

Gly Val Ser Ser Phe Gly Met Ser Gly Thr Asn Ala His Ala Ile
4340 4345 4350

Ile Glu Leu Ala Pro Asp Ala Ala Thr Pro Ser Ala Ala Arg Pro
4355 4360 4365

Glu Pro Ala Pro Ala Ala Leu Pro Trp Asn Leu Ser Ala Arg Thr
4370 4375 4380

Pro Asp Ala Leu Arg Ala Gln Gly Glu Arg Leu Leu Ser His Leu
4385 4390 4395

Glu Thr His Cys Glu Thr His Pro Glu Thr Val Leu Ala Asp Ile
4400 4405 4410

Gly His Ser Leu Thr Thr Gly Arg Ala Leu Phe Glu His Arg Ala
4415 4420 4425

Thr Val Val Ala Gly Asp Arg Asp Gly Phe Arg Ala Gly Leu Ala
4430 4435 4440

Ala Leu Ala Glu Gly Arg Thr Ala Ala Gly Leu Ile Gln Gly Ser
4445 4450 4455

Ser Ser Thr Gly Gly Arg Thr Ala Phe Leu Phe Thr Gly Gln Gly
4460 4465 4470

Ser Gln Arg Leu Gly Met Gly Arg Glu Leu Tyr Glu Ala Tyr Pro
4475 4480 4485

Val Phe Ala Arg Ala Leu Asp Glu Val Cys Ala Arg Leu Glu Leu
4490 4495 4500

Pro Leu Pro Leu Lys Asp Val Leu Phe Gly Thr Asp Thr Gly Leu

4505 4510 4515

Leu Asn Glu Thr Ala Tyr Thr Gln Pro Ala Leu Phe Ala Val Glu
4520 4525 4530

Val Ala Leu Phe Arg Leu Val Glu Ser Trp Gly Leu Lys Pro Asp
4535 4540 4545

Phe Leu Ala Gly His Ser Ile Gly Glu Ile Ala Ala Ala His Val
4550 4555 4560

Ala Gly Val Leu Ser Leu Glu Asp Ala Cys Ala Leu Val Ser Ala
4565 4570 4575

Arg Gly Arg Leu Met Gly Ala Leu Pro Gly Gly Gly Val Met Ile
4580 4585 4590

Ala Val Gln Ala Ser Glu Gly Glu Val Leu Pro Leu Leu Thr Asp
4595 4600 4605

Arg Val Ser Ile Ala Ala Ile Asn Gly Pro Gln Ser Val Val Ile
4610 4615 4620

Ala Gly Asp Glu Ala Asp Ala Val Ala Ile Val Glu Ser Phe Ser
4625 4630 4635

Asp Arg Lys Ser Lys Arg Leu Thr Val Ser His Ala Phe His Ser
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Glu Pro Ile Ala Ile Val Gly Met Ser Cys Arg Tyr Pro Gly Asp Val
35 40 45

Glu Ser Pro Glu Asp Leu Trp Arg Leu Val Ser Glu Glu Thr Asp Ala
50 55 60

Ile Ser Pro Phe Pro Thr Asp Arg Gly Trp Asp Met Gly Arg Leu Phe
65 70 75 80

Asp Ala Asp Pro Asp Gly Arg Gly Thr Ser Tyr Val Gln Glu Gly Gly
85 90 95

```
Phe Leu His Ser Ala Asn Arg Phe Asp Pro Ala Phe Phe Gly Ile Ser
            100                 105                 110

Pro Arg Glu Ala Val Ala Met Asp Pro Gln Gln Arg Leu Leu Leu Glu
        115                 120                 125

Thr Ser Trp Glu Ala Phe Glu Arg Ala Gly Ile Asp Pro Thr Ser Leu
    130                 135                 140

Arg Gly Ser Arg Thr Gly Val Phe Ala Gly Val Met Tyr His Asp Tyr
145                 150                 155                 160

Ala Ser Arg Leu Arg Ala Val Pro Glu Glu Val Glu Gly Tyr Leu Gly
                165                 170                 175

Thr Gly Gly Ser Ser Ser Ile Ala Ser Gly Arg Val Ser Tyr Thr Phe
            180                 185                 190

Gly Leu Glu Gly Pro Ala Leu Thr Val Asp Thr Ala Cys Ser Ser Ser
        195                 200                 205

Leu Val Thr Leu His Leu Ala Met Gln Ala Leu Arg Lys Gly Glu Cys
    210                 215                 220

Ser Leu Ala Leu Ala Gly Gly Val Thr Val Met Ala Thr Pro Gly Thr
225                 230                 235                 240

Phe Thr Glu Phe Ser Arg Gln Arg Gly Leu Ser Phe Asp Gly Arg Cys
                245                 250                 255

Lys Ser Phe Ala Asp Ser Ala Asp Gly Thr Gly Trp Ala Glu Gly Ala
            260                 265                 270

Gly Met Leu Leu Val Glu Arg Leu Ser Asp Ala Arg Lys Asn Gly His
        275                 280                 285

Thr Val Leu Ala Val Val Arg Gly Ser Ala Val Asn Gln Asp Gly Ala
    290                 295                 300

Ser Asn Gly Leu Thr Ala Pro Asn Gly Pro Ser Gln Gln Arg Val Ile
305                 310                 315                 320

Arg Gln Ala Leu Ala Asp Ala Arg Leu Thr Ala Ala Asp Val Asp Val
                325                 330                 335

Val Glu Ala His Gly Thr Gly Thr Thr Leu Gly Asp Pro Ile Glu Ala
            340                 345                 350

Gln Ala Leu Leu Ala Thr Tyr Gly Arg Glu His Thr Glu Asp Ser Pro
        355                 360                 365

Leu Trp Leu Gly Ser Val Lys Ser Asn Leu Gly His Thr Gln Ala Ala
    370                 375                 380

Ala Gly Val Ala Gly Ile Ile Lys Met Val Met Ala Ile Arg His Gly
385                 390                 395                 400

Arg Ile Pro Lys Thr Leu His Val Asp Glu Pro Ser Thr Asn Val Asp
                405                 410                 415

Trp Ser Ala Gly Ala Val Ser Leu Leu Arg Glu Ser Val Glu Trp Pro
            420                 425                 430
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Glu Thr Gly Arg Pro Arg Arg Ala Ala Ile Ser Ser Phe Gly Ile Ser
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Gly Thr Asn Ala His Thr Ile Ile Glu Gln Ala Pro Leu Pro Glu Ala
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Glu Thr Glu Thr Glu Pro Thr Gly Asp Glu Thr Asp Gly Ser Glu Ser
465 470 475 480

Thr Ala Gly Ala Glu Gly Thr Glu Gly Thr Glu Gly Ala Gly Val Arg
485 490 495

Pro Val Ser Val Pro Pro Val Leu Pro Trp Pro Val Ser Ala Arg Thr
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Glu Glu Ala Leu His Ala Gln Ala Glu Arg Leu Leu Ala His Val Arg
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Thr Asn Pro Asp Gln Ala Pro Val Gly Val Ala Leu Ser Leu Ala Thr
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Gly Arg Ala Ala Leu Glu His Arg Ala Val Val Val Ala Thr Asp Arg
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Glu Thr Ala Leu Ala Asp Leu Ala Ala Leu Ala Ser Gly Glu Thr Ser
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Ala Arg Val Val Leu Gly Glu Pro Gly Ala Arg Gly Lys Thr Ala Phe
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Leu Phe Thr Gly Gln Gly Ser Gln Arg Leu Gly Met Gly Arg Glu Leu
595 600 605

Tyr Glu Glu Tyr Pro Val Phe Ala Asp Ala Leu Asp Ala Val Cys Ala
610 615 620

Arg Leu Glu Leu Pro Leu Lys Asp Val Leu Phe Gly Ala Asp Ala Arg
625 630 635 640

Leu Leu Asp Glu Thr Ala Tyr Thr Gln Pro Ala Leu Phe Ala Val Glu
645 650 655

Val Ala Leu Phe Arg Leu Val Glu Ser Trp Gly Leu Lys Pro Asp Phe
660 665 670

Leu Ala Gly His Ser Ile Gly Glu Ile Ala Ala Ala His Val Ala Gly
675 680 685

Val Phe Ser Leu Glu Asp Ala Cys Ala Leu Val Ser Ala Arg Gly Arg
690 695 700

Leu Met Gly Ala Leu Pro Ala Gly Gly Val Met Ile Ala Val Gln Ala
705 710 715 720

Ser Glu Asp Glu Val Leu Pro Leu Leu Thr Ala Arg Val Ser Ile Ala
725 730 735

Ala Ile Asn Gly Pro Gln Ser Val Val Ile Ala Gly Asp Glu Ala Asp
740 745 750

Ala Val Ala Ile Val Glu Ser Phe Thr Gly Arg Lys Ser Lys Arg Leu
755 760 765

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Thr Val Ser His Ala Phe His Ser Pro His Met Asp Gly Met Leu Glu
    770                 775                 780

Asp Phe Arg Val Val Ala Glu Gly Leu Ser Tyr Glu Ala Pro Arg Ile
785                 790                 795                 800

Pro Val Val Ser Asn Leu Thr Gly Ala Leu Val Ser Asp Glu Met Gly
                805                 810                 815

Ser Ala Asp Phe Trp Val Arg His Val Arg Glu Ala Val Arg Phe Leu
            820                 825                 830

Asp Gly Ile Arg Ala Leu Glu Ala Ala Gly Val Thr Thr Tyr Val Glu
        835                 840                 845

Leu Gly Pro Asp Gly Val Leu Ser Ala Met Ala Gln Ala Cys Val Thr
    850                 855                 860

Gly Glu Asn Ser Val Phe Val Pro Val Leu Arg Ser Gly Arg Ser Glu
865                 870                 875                 880

Ala Glu Ser Val Thr Thr Ala Leu Ala Gln Ala His Val Arg Gly Ile
                885                 890                 895

Ala Val Asp Trp Gln Ala Tyr Phe Ala Gly Thr Gly Ala Glu Arg Val
            900                 905                 910

Asp Leu Pro Thr Tyr Ala Phe Gln Arg Asp His Tyr Trp Leu Asp Ala
        915                 920                 925

Gly Thr Leu Gly Gly Asp Val Thr Thr Ala Gly Leu Arg Ser Ala Asp
    930                 935                 940

His Pro Leu Leu Gly Ala Ser Val Ala Leu Ala Asp Ala Glu Gly Leu
945                 950                 955                 960

Leu Leu Thr Gly Arg Leu Ser Leu Asp Thr His Pro Trp Leu Ala Asp
                965                 970                 975

His Ala Val Ala Gly Thr Val Leu Leu Pro Gly Thr Ala Phe Val Glu
            980                 985                 990

Leu Ala Leu Arg Ala Gly Asp Gln  Val Gly Cys Asp Leu  Ile Asp Glu
        995                 1000                1005

Leu Thr  Leu Ala Ala Pro Leu  Val Leu Pro Glu Gln  Gly Gly Val
    1010                1015                1020

Glu Leu  Gln Ile Thr Val Ala  Ala Pro Asp Glu Ser  Gly Arg Arg
    1025                1030                1035

Ser Val  Ala Phe His Ser Arg  Ala Asp Ser Ala Ala  Asp Asp Glu
    1040                1045                1050

Ala Trp  Val Arg His Ala Thr  Ala Val Leu Ala Glu  Gly Ala Asp
    1055                1060                1065

Thr Pro  Val Phe Asp Phe Gly  Val Trp Pro Pro Thr  Gly Ala Glu
    1070                1075                1080

Ser Val  Pro Val Asp Gly Leu  Tyr Glu Gly Leu Ala  His Ser Gly
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Phe Gly  Tyr Gly Pro Val Phe  Gln Gly Leu Arg Ala  Ala Trp Arg
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Gln Gly  Glu Asp Val Phe Ala  Glu Val Ser Leu Gly  Asp Gly Val
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Glu Pro  Gly Ala Ala His Phe  Thr Val His Pro Ala  Leu Leu Asp
    1130                 1135                 1140

Ser Ala  Leu His Ala Ile Asn  Leu Gly Thr Leu Val  Glu Asp Thr
    1145                 1150                 1155

Gly Gln  Gly Arg Leu Pro Phe  Ala Trp Ser Gly Val  Ala Val His
    1160                 1165                 1170

Ala Val  Gly Ala Asp Thr Leu  Arg Val Arg Leu Ser  Arg Ala Gly
    1175                 1180                 1185

Gln Asp  Ala Val Ala Leu Glu  Ile Ala Asp Ala Asp  Gly Ala Pro
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Val Ala  Ser Val Arg Ser Leu  Ala Leu Arg Ala Phe  Ser Pro Asp
    1205                 1210                 1215

Gln Leu  Thr Gly Pro Asp Gly  Ala Gly His Gly Asp  Ala Leu Phe
    1220                 1225                 1230

Arg Val  Asp Trp Ala Ala Leu  Pro Ala Gly Gly Ala  Val Gly Ser
    1235                 1240                 1245

Leu Asp  Asp Trp Met Leu Leu  Gly Ala Gly Ser Gln  Val Tyr Ala
    1250                 1255                 1260

Asp Leu  Ala Gly Leu Gly Val  Ala Val Ala Glu Gly  Gly Gly Ile
    1265                 1270                 1275

Pro Ala  Ala Leu Val Val Pro  Val Ser Glu Pro Asp  Ala Glu Ser
    1280                 1285                 1290

Ala Ala  Gly Gly Val Ala Gly  Ala Val His Ala Ala  Val Glu Arg
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Ala Leu  Gly Leu Val Gln Glu  Trp Leu Ser Asp Glu  Arg Phe Ala
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Asp Ala  Arg Leu Val Phe Leu  Thr Arg Gly Ala Ala  Ala Ala Arg
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Ala Gly  Asp Thr Val Pro Gly  Leu Val Gln Ala Ala  Val Arg Gly
    1340                 1345                 1350

Leu Val  Arg Ser Ala Gln Ser  Glu Asn Pro Gly Arg  Phe Ala Leu
    1355                 1360                 1365

Ile Asp  Val Asp Gly Asp Gly  Glu Val Asp Ala Glu  Val Leu Ser
    1370                 1375                 1380

Ala Ala  Leu Ala Thr Gly Glu  Pro Glu Leu Ala Val  Arg Glu Ala
    1385                 1390                 1395

Ala Leu  Leu Val Pro Arg Leu  Ala Arg Ala Ala Val  Ala Val Glu
    1400                 1405                 1410
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Pro Ala  Pro Glu Leu Gly Ser  Asp Gly Thr Val Leu  Val Thr Gly
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Ala Ser  Gly Thr Leu Gly Gly  Leu Phe Ala Arg His  Leu Val Val
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Glu Arg  Gly Val Arg Arg Leu  Leu Leu Val Ser Arg  Arg Gly Glu
    1445                 1450                 1455

Ala Ala  Glu Gly Ala Ala Glu  Leu Gly Ala Glu Leu  Thr Gly Leu
    1460                 1465                 1470

Gly Ala  Asp Val Arg Trp Ala  Ala Cys Asp Val Ala  Asp Arg Glu
    1475                 1480                 1485

Ala Leu  Glu Ser Val Leu Ala  Gly Ile Pro Ala Glu  Tyr Pro Leu
    1490                 1495                 1500

Ser Gly  Val Val His Thr Ala  Gly Val Leu Asp Asp  Gly Val Val
    1505                 1510                 1515

Ser Ser  Leu Thr Ala Glu Arg  Val Ser Ala Val Leu  Arg Pro Lys
    1520                 1525                 1530

Val Asp  Ala Ala Trp Asn Leu  His Glu Leu Thr Arg  Gly Leu Asp
    1535                 1540                 1545

Leu Ser  Leu Phe Val Leu Phe  Ser Ser Ala Ala Gly  Val Phe Gly
    1550                 1555                 1560

Gly Ala  Gly Gln Ala Asn Tyr  Ala Ala Ala Asn Val  Phe Leu Asp
    1565                 1570                 1575

Ala Leu  Ala Gln His Arg Arg  Ala Gln Gly Leu Ala  Ala Thr Ser
    1580                 1585                 1590

Leu Ala  Trp Gly Leu Trp Asp  Glu Pro Gly Gly Met  Ala Gly Ala
    1595                 1600                 1605

Leu Asp  Ala Asp Asp Val Ser  Arg Leu Gly Arg Gly  Gly Val Ser
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Gly Leu  Ser Ala Gly Glu Gly  Val Ala Leu Phe Asp  Ala Ala Ser
    1625                 1630                 1635

Ala Ser  Glu Gln Ala Leu Phe  Val Pro Val Lys Leu  Asp Leu Ala
    1640                 1645                 1650

Ala Leu  Arg Ala Gln Ala Gly  Ser Gly Met Leu Pro  Pro Leu Leu
    1655                 1660                 1665

Ser Gly  Leu Val Arg Thr Pro  Thr Arg Arg Ala Ala  Arg Gly Gly
    1670                 1675                 1680

Ser Ala  Ala Gly Gly Thr Phe  Ala Arg Lys Leu Ala  Gly Leu Ala
    1685                 1690                 1695

Val Asp  Gln Arg Ser Ala Ala  Val Met Glu Leu Val  Arg Ala Gln
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Val Ala  Ala Val Leu Gly Leu  Ala Gly Pro Glu Ala  Val Asp Pro
    1715                 1720                 1725
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Ala Arg Ser Phe Ser Glu Val Gly Phe Asp Ser Leu Thr Ala Val
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Glu Leu Arg Asn Arg Leu Gly Ala Ala Thr Gly Val Arg Leu Pro
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Ala Thr Leu Val Phe Asp Tyr Pro Thr Ser Leu Ala Leu Ala Asp
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Phe Leu Gly Gly Glu Leu Leu Gly Gly Gln Glu Ala Ala Ala Ala
1775 1780 1785

Pro Thr Ala Phe Thr Ala Arg Asp Asp Glu Pro Ile Ala Ile Val
1790 1795 1800

Ala Met Ser Cys Arg Phe Pro Gly Gly Val Arg Ser Pro Glu Asp
1805 1810 1815

Leu Trp Gly Leu Val Leu Asp Gly Arg Asp Ala Ile Ser Asp Met
1820 1825 1830

Pro Asp Asp Arg Gly Trp Asp Val Glu Gly Leu Phe Asp Pro Asp
1835 1840 1845

Pro Asp Arg Pro Gly Thr Ser Tyr Ser Arg Ala Gly Gly Phe Leu
1850 1855 1860

His Asp Ala His His Phe Asp Pro Thr Phe Phe Gly Ile Ser Pro
1865 1870 1875

Arg Glu Ala Leu Ala Thr Asp Pro Gln Gln Arg Leu Leu Leu Glu
1880 1885 1890

Thr Ser Trp Glu Ala Phe Glu Arg Ala Gly Ile Asp Pro Ala Thr
1895 1900 1905

Val Arg Gly Ser Arg Thr Gly Val Phe Ala Gly Val Met Tyr Asn
1910 1915 1920

Asp Tyr Gly Thr Leu Leu His Arg Ala Pro Glu Gly Leu Glu Gly
1925 1930 1935

Tyr Met Gly Thr Ser Ser Ser Gly Ser Val Ala Ser Gly Arg Val
1940 1945 1950

Ser Tyr Thr Phe Gly Leu Glu Gly Pro Ala Val Thr Val Asp Thr
1955 1960 1965

Ala Cys Ser Ser Ser Leu Val Thr Leu His Leu Ala Val Gln Ala
1970 1975 1980

Leu Arg Asn Gly Glu Cys Asp Leu Ala Leu Ala Gly Gly Val Thr
1985 1990 1995

Val Met Ala Thr Pro Gly Thr Phe Val Ala Phe Ser Arg Gln Arg
2000 2005 2010

Gly Leu Ala Ser Asp Gly Arg Cys Lys Pro Phe Ala Ala Ala Ala
2015 2020 2025

Asp Gly Thr Ala Trp Gly Glu Gly Val Gly Met Leu Leu Val Glu
2030 2035 2040

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Arg Leu  Ser Asp Ala Arg Ala  Lys Gly His Pro Val  Leu Ala Val
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Val Arg  Gly Ser Ala Ile Asn  Gln Asp Gly Ala Ser  Asn Gly Leu
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Thr Ala  Pro Asn Gly Pro Ser  Gln Gln Arg Val Ile  Arg Gln Ala
    2075                 2080                 2085

Leu Ala  Ser Ala Gly Leu Ser  Ala Ala Asp Val Asp  Val Val Glu
    2090                 2095                 2100

Ala His  Gly Thr Gly Thr Thr  Leu Gly Asp Pro Ile  Glu Ala Gln
    2105                 2110                 2115

Ala Leu  Leu Ala Thr Tyr Gly  Gln Glu His Thr Asp  Asp Ser Pro
    2120                 2125                 2130

Leu Trp  Leu Gly Ser Ile Lys  Ser Asn Phe Gly His  Thr Gln Ala
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Ala Ala  Gly Val Ala Gly Ile  Ile Lys Met Val Gln  Ala Met His
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His Gly  Val Val Pro Lys Thr  Leu His Val Asp Glu  Pro Ser Pro
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His Val  Asp Trp Ser Ala Gly  Ala Val Ser Leu Leu  Thr Glu Gln
    2180                 2185                 2190

Met Ala  Trp Pro Glu Thr Gly  Arg Pro Arg Arg Ala  Ala Ile Ser
    2195                 2200                 2205

Ser Phe  Gly Ile Ser Gly Thr  Asn Ala His Thr Ile  Ile Glu Gln
    2210                 2215                 2220

Ala Pro  Glu Glu Phe Ala Pro  Val Arg Pro Val Arg  Val Ile Glu
    2225                 2230                 2235

Pro Glu  Ala Val Gly Ala Gly  Ser Arg Val Leu Pro  Phe Val Leu
    2240                 2245                 2250

Ser Ala  Lys Ser Ala Gly Ala  Leu Arg Gly Gln Ala  Val Arg Leu
    2255                 2260                 2265

Lys Ala  His Val Glu Ala Ser  Pro Glu Val Ser Gly  Ala Gly Ala
    2270                 2275                 2280

Ala Asp  Val Ala Tyr Ser Leu  Ala Thr Arg Arg Ala  Val Phe Asp
    2285                 2290                 2295

His Arg  Ala Val Val Val Ala  Gly Asp Arg Glu Glu  Leu Leu Arg
    2300                 2305                 2310

Ala Leu  Ala Ala Val Glu Ser  Glu Gly Thr Ala Ala  Gly Val Thr
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Arg Gly  Thr Ala Gly Gly Gly  Lys Leu Ala Phe Leu  Phe Thr Gly
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Gln Gly  Ser Gln Arg Leu Gly  Met Gly Arg Glu Leu  Tyr Glu Thr
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Glu Leu Pro Leu Lys Asp Ala Leu Phe Gly Ala Asp Ala Gly Leu
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Leu Asp Glu Thr Ala Tyr Thr Gln Pro Ala Leu Phe Ala Val Glu
2390 2395 2400

Val Ala Leu Phe Arg Leu Leu Glu Ser Trp Gly Val Arg Pro Asp
2405 2410 2415

Phe Leu Ala Gly His Ser Ile Gly Glu Ile Ala Ala Ala His Val
2420 2425 2430

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cctgtcttcc gcaacctgcg cgctgcctgg cggcgcggcg acgagctgtt cgccgaactg 8640

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accgtcgccg cgtgtgacgc cgccgaccgg gaggcgctgg ccgcgctgct ggccggcatt 9840

ccggccgcgc acccccctcac ggccgtcgtc cacacggcgg gccgcgtcga cgacgggctc 9900

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ttccgcgggc tggtgcgcgg aggtcctcgc agggccgccg cacatcaggc cgccgattcg 10440

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ttcttcgact ggacccggtc cacggacggc gactggcgtt cgtactggga cctggaccac 11520

acggccctgg acgtgccggg caaccacttc accatgatgg aggagcacgc tccgacgacc 11580

gcacaggccg tcgaggggtg gctggacacg accggctga 11619

<210> 39
<211> 338
<212> PRT
<213> Streptomyces aizunensis

<400> 39

Met Thr Thr Ser Asp Ser Arg Ser Asp Ser Arg Ser Gly Ser Asp Ser
1 5 10 15

Gly Phe Asn Ser Gly Phe Asp Ser Glu Gln Thr Pro Ser Thr Glu Thr
20 25 30

Ala Ile Val Phe Pro Gly Met Gly Pro Ser Ser Phe Ala Glu Val Gly
35 40 45

Lys Phe Leu Leu Leu Asp Pro Tyr Ala Arg Arg Arg Leu Ala Glu Ala
50 55 60

Asp Glu Ala Leu Gly Tyr Ser Val Phe Asp Arg Phe Arg Thr Ser Glu
65 70 75 80

Asp Asp Tyr Ser Val Tyr Ser Gln Ile Ala Phe Leu Val Asn Ser Met
85 90 95

Ala Met Ala Asp Arg Ala Val Asp Ala Leu Gly Ile Ser Pro Thr Val
100 105 110

Cys Ala Gly Pro Ser Phe Gly Gln Lys Ala Ala Ser Ala Phe Val Gly
115 120 125

Ser Leu Pro Phe Ala Asp Val Val Arg Leu Thr Ala Glu Leu Ala Arg
130 135 140

Cys Glu Glu Glu Tyr Phe Ala Asp Ala Tyr Gln Asp Val Val Thr His
145 150 155 160

Cys Phe Val Arg Thr Pro Gln Asp Arg Leu Asp Glu Ile Leu Ala Gly
165 170 175

Phe Asp Asp Arg Gly Ala Trp Tyr Asp Ile Ser Gly Arg Leu Asp Ala
180 185 190

Ala Phe His Met Val Ser Val Gln Glu Lys Glu Leu Asp Gly Leu Lys
195 200 205

Ala Gly Ile Ser Ala Val Gly Gly Tyr Ser Met Tyr Ser Met Arg Pro
210 215 220

Pro Val His Ala Ala Ala Phe Ser Ala Leu Arg Arg Lys Ala Glu Glu
225 230 235 240

Glu Val Phe Ala Ala Tyr Glu Leu Ala Asp Pro Thr Leu Pro Val Val
245 250 255

Asn Asp Gln Asp Gly Gly Val Val Arg Asp Ala Ala Gly Met Arg Thr
260 265 270

Met Met Leu Asp Thr Phe Asp Arg Pro Val His Trp Pro Gly Val Val
275 280 285

Glu Ser Leu Lys Gly Leu Gly Val Gly Thr Val Cys Val Thr Gly Pro
290 295 300

Asp Asn Leu Phe His Arg Leu Asp Leu Thr Lys Asp Ser Phe Glu Val
305 310 315 320

Val Thr Val Gly Leu Pro Lys Lys Arg Ser Arg Glu Arg Glu Lys Arg
325 330 335

Val Ala

<210> 40
<211> 1017
<212> DNA
<213> Streptomyces aizunensis

<400> 40
atgaccactt ctgattcccg ttccgactcc cgttccggct ccgactccgg cttcaactcc 60

ggcttcgact ccgagcagac tccctcgacc gagacggcga tcgtctttcc cggtatgggc 120

ccctcgtcct tcgcggaggt cggaaagttc ctgctgctcg acccttacgc gcgccggcgc 180

ctcgcggagg cagacgaggc gctcggatat tcggtgttcg accgtttccg cacctccgag 240

gacgactact cggtctattc gcagatcgcc ttcctggtga attcgatggc tatggccgac 300

cgggcggtgg acgcgctcgg catctctccc accgtctgcg ccggcccgag tttcggccag 360

aaggccgcct ccgctttcgt cgggtcgctg cccttcgcgg acgtcgtccg gctcaccgcg 420

gagctggccc gctgcgagga ggagtacttc gccgacgcgt accaggacgt cgtcacgcac 480

tgcttcgtcc gcaccccgca ggaccggctg gacgagatcc tggccggctt cgacgaccgc 540

ggtgcctggt acgacatctc cgggcggctg gacgccgctt tccacatggt gtccgtacag 600

gagaaggagc tggacgggct gaaggcgggc atcagcgcgg tcggcggcta ctccatgtac 660

tcgatgcgcc cgcccgtgca cgcggcggcc ttctcggcgc tgcgccgcaa ggcggaggaa 720

gaggtcttcg ccgcgtacga actggccgac cccaccctgc ccgtggtcaa cgaccaggac 780

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cccgtccact ggccgggcgt ggtggagtcc ctcaaggggc tcggcgtggg cacggtgtgc 900

gtgaccgggc ccgacaacct cttccaccgc ctcgacctca ccaaggacag cttcgaggtc 960

gtgacggtgg ggctgccgaa gaagcgctcc cgcgagcgtg agaagcgcgt cgcctga 1017

<210> 41
<211> 283
<212> PRT
<213> Streptomyces aizunensis

<400> 41

Met Thr Ala Thr Leu Thr Ala Pro Asp Pro Val Thr Asp Phe Pro Ala
1 5 10 15

Glu Leu Arg Pro Ala Arg Thr Asp Val Arg Thr Ala Thr Arg Thr Phe
20 25 30

Phe Phe Ile Leu Trp Arg Asp Ile Phe Val Thr Gly Arg Glu Leu Gly
35 40 45

Pro Phe Leu Ala Gln Val Leu Val Glu Pro Phe Phe Ile Leu Phe Val
50 55 60

Phe Gly Lys Val Leu Gly Glu Leu Gly Tyr Thr Gly Gly Gly Phe Gln
65 70 75 80

Gln Ile Leu Leu Pro Gly Val Val Ala Leu Asn Ser Phe Leu Val Ser
85 90 95

Leu Gln Asn Thr Ala Leu Pro Leu Val Ile Asp Phe Ser Trp Thr Lys
100 105 110

Glu Ile Glu Asp Arg Leu Leu Ala Pro Ile Pro Thr Ser Leu Val Ala
115 120 125

Val Glu Lys Leu Val Phe Gly Ala Leu Arg Gly Ile Ile Ala Ser Leu
130 135 140

Val Met Ile Pro Val Gly Phe Leu Ile Leu Asp Asp Val Ser Trp Pro
145 150 155 160

Met Asp Ser Phe Leu Pro Thr Leu Gly Val Leu Leu Thr Gly Ala Leu
165 170 175

Ala Gly Ser Thr Val Gly Leu Thr Ile Gly Thr Leu Ala Pro Pro Arg
180 185 190

His Ile Ser Val Ile Phe Ala Val Thr Leu Thr Pro Leu Met Phe Thr
195 200 205

Gly Cys Thr Gln Phe Pro Trp His Ser Leu Ala Asp Ile Arg Trp Phe
210 215 220

Gln Val Leu Cys Ala Ile Asn Pro Leu Thr Tyr Val Ser Glu Gly Ile
225 230 235 240

Arg Ala Leu Leu Leu Pro Pro Gly Gly Pro Gly Ser Ile Pro Leu Trp
245 250 255

Ile Asp Leu Leu Ala Leu Ser Gly Ala Ile Val Val Phe Gly Leu Ile
260 265 270

Gly Ile Lys Gly Phe His Arg Arg Ala Gln Asp
275 280

<210> 42
<211> 852
<212> DNA
<213> Streptomyces aizunensis

<400> 42
atgacggcca ccctgaccgc acccgacccg gtcaccgact tcccggccga actgcggccc 60

gcgcgcaccg acgtgcgcac cgcgacccgc acgttcttct tcatcctgtg gcgggacatc 120

ttcgtcaccg gccgcgaact gggcccgttc ctcgcccagg tgctcgtgga accgttcttc 180

atcctgttcg tcttcggcaa ggtcctcggc gaactcggtt acaccggcgg cgggttccag 240

cagatcctgc tcccgggcgt ggtcgcgctc aacagcttcc tggtcagcct gcagaacacc 300

gcgctgcccc tggtcatcga cttctcctgg accaaggaga tcgaggaccg gctcctcgcg 360

cccatcccca ccagcctggt ggccgtcgag aagctggtct tcggggcgct gcgcggcatc 420

atcgcctcac tggtgatgat ccccgtcggc ttcctgatcc tcgacgacgt gtcctggccg 480

atggacagct tcctgcccac gctgggcgtg ctgctgacgg gcgcgctggc gggcagcacg 540

gtgggtctga ccatcggcac gctggccccg ccgcggcaca tcagcgtcat cttcgccgtg 600

acgctgaccc cgctgatgtt caccggctgc acccagttcc cctggcacag cctggcggac 660

atccgctggt tccaggtgct gtgcgccatc aacccgctga cctacgtcag cgaggggatc 720

cgcgccctgc tgctgccgcc gggcggcccc ggctcgattc cgctgtggat cgatctgctc 780

gccctgagcg gggcgatcgt ggtcttcggg ctgatcggca tcaaggggtt ccaccgcagg 840

gcgcaggact ga 852

<210> 43
<211> 329
<212> PRT
<213> Streptomyces aizunensis

<400> 43

Val Asp Ser Ala Val Val Val Asp Gly Leu Val Lys Lys Tyr Arg Ser
1 5 10 15

Arg Asp Arg Pro Ala Val Asp Asp Leu Ser Phe Ser Val Arg Arg Gly
20 25 30

Glu Val Phe Gly Phe Leu Gly Pro Asn Gly Ala Gly Lys Thr Thr Thr
35 40 45

Ile Gly Ile Leu Thr Thr Arg Val Ala Pro Thr Ala Gly Arg Ala Phe
50 55 60

Val Gln Gly Val Asp Val Val Ala His Pro Ala Gln Ala Arg Arg Ala
65 70 75 80

Phe Ala Val Val Pro Gln Arg Asn Asn Leu Asp Arg Ser Leu Thr Leu
85 90 95

Arg Gln Asn Leu Thr Phe His Ala Gly Tyr His Gly Met Ser Arg Ser
100 105 110

Glu Arg Gly Arg Leu Ala Asp Glu Cys Leu Glu Trp Val Gly Leu Ala
115 120 125

Asp Arg Gly Lys Ala Arg Gly Asp Glu Leu Ser Gly Gly Gln Ala Gln
130 135 140

Arg Val Met Ile Ala Arg Ala Leu Met His Arg Pro Asp Val Leu Phe

145 150 155 160

Leu Asp Glu Pro Ala Thr Gly Leu Asp Pro Gln Ala Arg Leu Phe Ile
165 170 175

His Glu Arg Val Ala Glu Leu Ser Lys Arg Gly Val Thr Thr Val Leu
180 185 190

Thr Thr His Asp Met Asp Glu Ala Ala Lys Leu Cys Asp Arg Val Gly
195 200 205

Ile Val Asp His Gly Arg Leu Leu Ala Leu Asp Thr Pro Gln Ala Leu
210 215 220

Thr Arg Ser Leu Ser Ser Thr Ala Leu Thr Leu Thr Val Gln Pro Ala
225 230 235 240

Gly His Asp Ala Glu Ser Val Val Arg Leu Leu Glu Arg Ile Glu Thr
245 250 255

Val Glu Arg Val Glu Leu Ala His Gln Glu His Ala Lys Glu Gln Gly
260 265 270

Gly Ala Pro Ala Pro Val Arg Leu Arg Leu Tyr Ser Asp Ala Pro Ser
275 280 285

Gly Ala Val Leu Pro Thr Ala Ile Thr Ala Leu Thr Glu Ala Ser His
290 295 300

Asp Ile Lys Asp Val Ser Val Gly Thr Ala Thr Leu Glu Asp Val Phe
305 310 315 320

Ile Lys Leu Thr Gly Arg Glu Leu Arg
325

<210> 44
<211> 990
<212> DNA
<213> Streptomyces aizunensis

<400> 44
gtggattccg ccgtcgtggt cgacggacta gtcaagaagt accggagccg cgaccgacca 60

gcggtggacg acctgagctt ctcggtccgc aggggcgagg tcttcggatt cctcggcccg 120

aacggggcgg gcaagacgac gaccatcggc atcctcacca cccgcgtggc ccccacggcg 180

gggcgagcgt tcgtccaggg cgtcgacgtc gtggcccacc ccgcccaggc gcgccgggcc 240

ttcgccgtcg taccgcagcg caacaacctc gaccggtcgc tgaccctccg gcagaacctg 300

accttccacg ccggctatca cggcatgagc cgctccgaac gcggacggct cgccgacgag 360

tgcctggagt gggtgggtct cgccgaccgg ggcaaggccc gcggcgacga actctccggc 420

ggccaggccc agcgcgtgat gatcgcccgg gccctgatgc accgccccga cgtgctcttc 480

ctcgacgagc ccgccaccgg actcgatccg caggcacggc tgttcatcca cgagcgcgtg 540

gccgagctga gcaagcgcgg ggtgaccacc gtgctgacca cgcacgacat ggacgaagcc 600

gccaagctct gcgaccgcgt cggcatcgtc gaccacggcc gactgctggc cctcgacacc 660

ccgcaggcgc tgacccggag cctgagcagc accgccctca ccctcaccgt ccagcccgcg 720

gggcacgacg ccgagagcgt cgtacgcctg ctggagcgga tcgagacggt cgagcgggtc 780

gagctggcac accaggaaca cgccaaggag cagggcggcg cgcccgcgcc ggtacggctc 840

cgcctctaca gcgacgcgcc gtccggcgcg gtgctgccga ccgccatcac ggccctgacg 900

gaagcgagtc acgacatcaa ggacgtgagc gtcggaaccg cgaccctgga ggacgtcttc 960

atcaagctca ccggccggga gctgcgatga 990

<210> 45
<211> 317
<212> PRT
<213> Streptomyces aizunensis

<400> 45

Val Ser Ala Gly Phe Gly Val Glu Pro Gly Ser Leu Arg Trp Met Val
1 5 10 15

Ile Gly Ala Thr Gly Met Leu Gly Gly Glu Val Ala Ala Gln Leu Thr
20 25 30

Ala Arg Gly Ala Asp Pro Val Gly Val Gly Ser Ala Asp Leu Asp Leu
35 40 45

Thr Asp Pro Gln Ala Val Ala Ala Ala Val Ala Asp Gly Gly Pro Asp
50 55 60

Val Val Val Asn Cys Ala Ala Trp Thr Ala Val Asp Leu Ala Glu Thr
65 70 75 80

Glu Glu Glu Ala Ala Leu Ala Val Asn Gly Thr Gly Ala Gly His Leu
85 90 95

Ala Arg Ala Cys Ala Ala Thr Gly Ser Arg Leu Leu His Val Ser Thr
100 105 110

Asp Tyr Val Phe Arg Gly Ala Pro Ala Asp Ala Gly His Pro Tyr Ala
115 120 125

Glu Asp Ala Glu Pro Asp Pro Ala Thr Ala Tyr Gly Arg Thr Lys Leu
130 135 140

Val Gly Glu Arg Ala Val Leu Ala Glu Leu Pro Ala Thr Ala Ala Val
145 150 155 160

Val Arg Thr Ser Trp Leu Tyr Gly Arg Asp Asn Gly Gly Phe Val His
165 170 175

Thr Met Ala Arg Leu Ala Arg Glu Pro Gly Arg Thr Val Asp Val Val
180 185 190

Asp Asp Gln His Gly Gln Pro Ser Trp Thr Pro Asp Val Ala Ala Arg
195 200 205

Ile Ile Glu Leu Ala Ala Leu Pro Ala Asp Arg Ala His Gly Val Phe
210 215 220

His Ala Thr Gly Gly Gly Arg Thr Thr Trp Tyr Asp Leu Ala Arg Glu

225 230 235 240

Val Phe Arg Leu Thr Gly Gln Asp Pro Asp Arg Val Arg Arg Ile Asp
245 250 255

Ser Ser Gly Leu Arg Arg Ala Ala Val Arg Pro Ala Trp Ser Val Leu
260 265 270

Gly His Asp Arg Trp Ala Ala Thr Gly Leu Ala Pro Met Arg His Trp
275 280 285

Arg Thr Ala Leu Ala Asp Ala Leu Met Gly Asp Pro Val Gly Asp Arg
290 295 300

Leu Pro Glu Ser Val Asn Ser Pro Gly Pro Lys Gly Cys
305 310 315

<210> 46
<211> 954
<212> DNA
<213> Streptomyces aizunensis

<400> 46
gtgtccgcgg gctttggggt ggaacccggg tcgctgcggt ggatggtgat cggcgcgacg 60

ggcatgctcg gcggcgaagt ggccgcccag ctcacggccc ggggcgccga cccggtgggg 120

gtcggcagtg cggatctgga cctcaccgac ccgcaggcgg tcgccgcggc cgtggccgac 180

ggcggccccg atgtcgtcgt caactgcgcc gcctggaccg ccgtggacct ggccgagacc 240

gaggaggagg cggccctcgc cgtcaacggg acgggagcgg gccacctcgc ccgggcctgc 300

gccgccaccg gcagccggct cctccacgtc tccaccgact acgtcttccg aggtgccccg 360

gccgatgccg gacaccccta tgcggaggac gccgaacccg accccgccac cgcgtacgga 420

cgcaccaagc tcgtcggcga gcgcgccgtc ctcgccgaac tccccgccac cgctgccgtg 480

gtgcgcacgt cctggctgta cggacgcgac aacggcggct tcgtgcacac catggcccgg 540

ctcgcgcgcg agccgggacg caccgtggac gtggtcgacg accagcacgg acagccgagc 600

tggaccccg atgtcgcggc ccggatcatc gagctcgccg ccctgcccgc cgaccgggcg 660

cacggcgtct tccatgccac cggcgggggc cgcaccacct ggtacgacct ggcccgcgag 720

gtgttccggc tgaccggcca ggacccggac cgggtccggc gcatcgacag ctccgggctg 780

cgacgggcgg cggtccgccc ggcatggagc gttctgggcc atgaccgctg ggccgccacg 840

gggctcgccc cgatgcgtca ctggcgcacg gccctcgcgg acgccctcat gggcgacccc 900

gtgggcgacc gacttcccga gagtgtgaac tcccccggcc cgaaaggctg ttga 954

<210> 47
<211> 204
<212> PRT
<213> Streptomyces aizunensis

<400> 47

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Val Lys Ser Leu Ser Ile Glu Gly Ala Trp Leu Tyr Glu Pro Leu Leu
1               5                  10                  15

His Asp Asp Glu Arg Gly Thr Phe Leu Glu Val Phe Gln Ser Gln Ala
            20                  25                  30

Phe Glu Leu Ala Thr Gly Arg Arg Leu Glu Leu Ala Gln Val Asn Cys
        35                  40                  45

Ser Val Ser Arg Arg Gly Val Val Arg Gly Val His Phe Ala Asp Leu
    50                  55                  60

Pro Pro Gly Gln Ala Lys Tyr Val Thr Cys Val Arg Gly Ala Val Arg
65                  70                  75                  80

Asp Val Ile Val Asp Leu Arg Thr Gly Ser Pro Thr Tyr Arg Ala Trp
                85                  90                  95

Glu Ala Val Glu Leu Asp Asp Arg Asp Arg Arg Ala Val Phe Leu Ser
            100                 105                 110

Glu Gly Leu Gly His Ala Phe Gln Ala Ile Thr Asp Asp Ala Thr Val
        115                 120                 125

Val Tyr Leu Thr Thr Ser Gly Tyr Ala Pro Gly Arg Glu His Gly Val
    130                 135                 140

His Pro Leu Asp Pro Glu Leu Gly Ile Thr Trp Leu Pro Gly Met Glu
145                 150                 155                 160

Pro Leu Leu Ser Pro Lys Asp Ala Val Ala Pro Thr Leu Ala Val Ala
                165                 170                 175

Glu Ala Gln Gly Leu Leu Pro Ala Tyr Glu Asp Cys Val Arg Tyr Val
            180                 185                 190

Ser Ser Leu Ala Thr Pro Leu Ser Glu Glu Thr Pro
        195                 200
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<210> 48
<211> 615
<212> DNA
<213> Streptomyces aizunensis

<400> 48

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cgcggcacgt tcctggaggt gttccagagc caggccttcg agctggccac cggccgccgc    120

ctcgaactgg cccaggtcaa ctgctccgtg tcccgccgcg gcgtcgtgcg cggcgtccac    180

ttcgccgact taccgcccgg ccaggccaag tacgtcacct gcgtacgcgg cgcggtgcgc    240

gatgtgatcg tggacctgcg caccggctcg cccacctacc gcgcctggga ggccgtcgaa    300

ctcgacgacc gcgaccggcg ggcggtcttc ctctccgagg gcctcggcca cgccttccag    360

gcgatcaccg acgacgccac cgtcgtctac ctgaccacct cgggctacgc ccccggccgt    420

gagcacggcg tccacccgct cgacccggag ctgggcatca cctggcttcc cggcatggaa    480

ccgctgctgt ccccgaagga cgctgtcgcc cccaccctcg cggtggccga ggcccagggt    540
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ctgctgcccg cgtacgagga ctgcgtacgg tacgtgtcct cgctcgccac accactcagc 600

gaggagaccc cgtga 615

<210> 49
<211> 328
<212> PRT
<213> Streptomyces aizunensis

<400> 49

Val Ala Asn Lys Pro Ile Leu Phe Tyr Val Leu Glu Gly Ile Ala Asp
1 5 10 15

Ala Gly Val Thr Asp Val Gly Ile Ile Val Gly Asp Thr Ala Asp Glu
20 25 30

Ile Arg Ala Ala Val Gly Asp Gly Ser Arg Phe Gly Ile Ser Val Thr
35 40 45

Tyr Ile Pro Gln His Gln Pro Leu Gly Leu Ala His Ala Val Arg Ile
50 55 60

Ala Arg Asp Trp Leu Gly Glu Asp Asp Phe Val Met Tyr Leu Gly Asp
65 70 75 80

Asn Phe Leu Leu Gly Gly Ile Ser Glu Gln Leu Glu Glu Phe Arg Thr
85 90 95

Arg Arg Pro Ala Ala Gln Ile Met Leu Thr Arg Val Pro Asp Pro Ser
100 105 110

Ala Phe Gly Val Val Thr Leu Asp Glu Ala Gly Arg Val Thr Gly Leu
115 120 125

Glu Glu Lys Pro Lys Phe Pro Lys Ser Asp Leu Ala Leu Val Gly Val
130 135 140

Tyr Phe Phe Thr Ala Ala Val His Asp Ala Val Asp Ala Ile Gln Pro
145 150 155 160

Ser Ala Arg Gly Glu Leu Glu Ile Thr Glu Ala Leu Gln Trp Leu Leu
165 170 175

Asp Lys Gly Leu Gly Ile Ala Ser Ser Thr Val Asn Gly Tyr Trp Lys
180 185 190

Asp Thr Gly Asn Ala Thr Asp Met Leu Glu Val Asn Arg Thr Val Leu
195 200 205

Asp Arg Leu Thr Pro Tyr Cys Asp Gly Ser Val Asp Gly Glu Ser Glu
210 215 220

Leu Val Gly Arg Val Val Val Glu Asp Gly Ala Val Ile Thr Arg Ser
225 230 235 240

Arg Ile Val Gly Pro Ala Ile Ile Gly Arg Gly Thr Arg Val Glu Gly
245 250 255

Ser Tyr Ile Gly Pro Phe Thr Ser Val Gly Ala Asp Cys Val Val Val
260 265 270

Asp Ser Glu Ile Glu Tyr Ser Ile Val Leu Ala Gly Ala Ala Ile Asp
275 280 285

Gly Val Gly Arg Ile Glu Ala Ser Met Ile Gly Arg Gln Ala Gln Val
290 295 300

Thr Pro Ala Pro Arg Thr Pro Gln Ala His Arg Leu Ile Leu Gly Asp
305 310 315 320

His Ser Lys Val Gln Ile Arg Ser
325

<210> 50
<211> 987
<212> DNA
<213> Streptomyces aizunensis

<400> 50
gtggccaaca aacccatcct cttctacgtc ctggaaggga tcgccgacgc gggcgtcacc 60

gatgtcggca tcatcgtcgg cgacacggcc gacgagatca gggcggccgt cggcgacggc 120

tcccgcttcg gcatcagcgt cacctacatc ccgcagcacc agccgctcgg cctggcccac 180

gccgtgcgca tcgcacggga ctggctcggc gaggacgact tcgtgatgta cctgggcgac 240

aacttcctgc tcggcgggat cagcgagcag ctggaggagt tccgcacccg gcggcccgcc 300

gcgcagatca tgctcacccg ggtccccgat ccctccgcct tcggcgtcgt caccctcgac 360

gaggcgggcc gggtcaccgg cctggaggag aagccgaagt tccccaagag cgatctcgcg 420

ctggtcggcg tgtacttctt caccgccgcc gtgcacgacg ccgtggacgc catccagccc 480

tccgcccgcg gcgagctgga gatcaccgag gccctccagt ggctcctcga caagggcctc 540

ggcatcgcgt cctccacggt caacggctac tggaaggaca ccggcaacgc caccgacatg 600

ctggaggtca accgcacggt gctcgacagg ctgaccccgt actgcgacgg ctccgtcgac 660

ggcgagagcg aactggtcgg ccgggtcgtc gtcgaggacg gcgcggtgat cacccgctcc 720

cggatcgtgg gccccgccat catcggccgc ggcacccgcg tcgagggctc ctacatcggc 780

ccgttcacct ccgtcggggc ggactgcgtg gtcgtcgaca gcgagatcga gtactccatc 840

gtgctggccg gcgcggccat cgacggcgtc ggccggatcg aggcgtccat gatcggccgt 900

caggcgcagg tcacccccgc gccccgcacg ccccaggccc accgtctgat cctcggcgac 960

cacagcaagg tgcagatccg ttcatga 987

<210> 51
<211> 328
<212> PRT
<213> Streptomyces aizunensis

<400> 51

Met Asn Ile Leu Ile Thr Gly Ala Ala Gly Phe Ile Gly Ser His Leu
1 5 10 15

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Val Arg Thr Ile Leu Gly Pro Asp Lys Pro Leu Gly Asp Asp Val Arg
            20                  25                  30

Val Thr Val Leu Asp Ala Leu Thr Tyr Ala Gly Asn Arg Ala Ser Leu
        35                  40                  45

Ala Ala Val Glu Asp Glu Pro Gly Phe Thr Phe Val His Gly Asp Ile
    50                  55                  60

Thr Asp Ala Leu Leu Val Asp Arg Leu Val Ala Ala His Asp Ala Val
65                  70                  75                  80

Val His Leu Ala Ala Glu Ser His Val Asp Arg Ser Ile Trp Arg Ala
                85                  90                  95

Asp Ala Phe Val Arg Thr Asn Val Leu Gly Thr His Thr Leu Leu Glu
            100                 105                 110

Ala Ala Leu Arg His Gly Thr Gly Pro Phe Val His Val Ser Thr Asp
        115                 120                 125

Glu Val Tyr Gly Ser Val Pro Val Gly Ser Ser Val Glu Ser Asp Pro
    130                 135                 140

Leu Thr Pro Ser Ser Pro Tyr Ser Ala Ser Lys Ala Ser Ser Asp Leu
145                 150                 155                 160

Leu Ala Leu Ala Tyr His His Thr His Gly Leu Asp Val Arg Val Thr
                165                 170                 175

Arg Cys Ser Asn Asn Tyr Gly Pro Tyr Gln His Pro Glu Lys Val Ile
            180                 185                 190

Pro Leu Phe Val Thr Arg Leu Leu Ser Gly Ala Ala Val Pro Leu Tyr
        195                 200                 205

Gly Asp Gly Gly Asn Val Arg Asp Trp Leu His Val Asp Asp His Cys
    210                 215                 220

Arg Ala Leu Leu Ala Val Leu Thr Asp Gly Arg Ala Gly His Thr Tyr
225                 230                 235                 240

Asn Ile Gly Gly Gly Thr Glu Leu Thr Asn Lys Glu Leu Thr Gly Leu
                245                 250                 255

Leu Leu Asp Ala Cys Gly Ala Gly Trp Asp Arg Val Glu His Val Thr
            260                 265                 270

Asp Arg Lys Gly His Asp Arg Arg Tyr Ser Val Asp Trp Thr Lys Ile
        275                 280                 285

Arg Thr Glu Leu Gly Tyr Thr Pro Ala His Asp Phe Ala Glu Gly Leu
    290                 295                 300

Ala Glu Thr Val Ala Trp Tyr Arg Thr Asn Arg Pro Phe Trp Ala Ala
305                 310                 315                 320

Pro Gly Ala Glu Leu Gln Gly Ala
                325
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<210> 52
<211> 987
<212> DNA

<213> Streptomyces aizunensis

<400> 52
atgaacatcc tgatcacggg agcggccggc ttcatcggct cccacctcgt acgcacgatc 60

ctgggcccgg acaaaccgct cggcgacgac gtccgcgtca ccgtcctgga cgcgctgacc 120

tacgcgggca accgcgcctc cctcgccgcc gtcgaggacg aaccgggctt caccttcgtg 180

cacggcgaca tcaccgacgc gctgctggtg gaccgcctgg tggcggccca cgacgccgtg 240

gtgcacctgg ccgccgagtc gcacgtcgac cgttcgatct ggcgggccga cgcgttcgta 300

cgcaccaatg tgctcggcac ccacaccctg ctggaggccg cgctgcggca cggcaccggc 360

ccgttcgtgc acgtgtcgac cgacgaggtg tacggctcgg tcccggtcgg ctcgtccgtc 420

gagagcgacc cgctgacgcc cagctcgccc tactccgcgt ccaaggcgtc cagtgatctg 480

ctggccctgg cctaccacca cacccacgga ctcgacgtgc gggtgacgcg ctgctccaac 540

aactacgggc cctaccagca cccggagaag gtgatcccgc tcttcgtcac ccggctgctc 600

agtggcgccg ccgtcccgct ctacggcgac ggcgggaacg tacgcgactg gctgcacgtc 660

gacgaccact gccgcgctct gctggccgtc ctcaccgacg ggcgcgcggg gcacacgtac 720

aacatcggcg gcggcaccga gctcaccaac aaggagctga ccggcctgct gctggacgcc 780

tgcggcgccg gatgggaccg ggtcgagcac gtcaccgacc gcaagggcca cgaccgccgg 840

tactccgtcg actggacgaa gatccgcacc gagctgggct acacccccgc gcacgacttc 900

gccgagggcc tcgccgagac cgtcgcctgg tacagaacca accgcccgtt ctgggcagcg 960

cccggggcgg agcttcaggg cgcatga 987

<210> 53
<211> 214
<212> PRT
<213> Streptomyces aizunensis

<400> 53

Met Thr His Glu Gly Thr Arg His Ser Thr Arg Glu Thr Thr Pro Asp
1 5 10 15

Asp Val Ser Leu Ile Gln Ile Arg Gln Pro Ala Ile Pro Ser Ser Tyr
20 25 30

Arg Met Ile Cys Phe Pro Ser Ser Arg Asn Ser Ser Ile Cys Tyr Leu
35 40 45

Ala Met Ser Glu Leu Leu Leu Pro Thr Val Glu Leu Leu Ile Val Gln
50 55 60

Tyr Pro Ala Leu Thr Ser Glu Glu Glu His Ser Ala Glu Glu Asp Ala
65 70 75 80

Ala Leu Ala Asp Lys Ile Phe Glu Ala Val Arg Gly Trp Ala Asp Arg
85 90 95

Pro Leu Ala Leu Phe Gly His Arg Leu Gly Ala Glu Leu Ala Tyr Ala
100 105 110

Val Ala Gln Arg Leu Glu Arg Glu Thr Asp Ala Ala Pro Leu Thr Leu
115 120 125

Phe Val Ser Gly Arg Thr Gly Pro Gly His Arg Gly Ser Leu Gly Pro
130 135 140

Pro Ala Leu Asn Cys Arg Val Val Ala Leu Ala Gly Tyr His Asp Pro
145 150 155 160

Arg Ala Pro Leu Ala Gly Val Arg Ala Trp Arg Arg Cys Thr Ala Gly
165 170 175

Arg Phe Asp Leu Glu Val Phe Pro Gly Thr Arg Gly Tyr Leu Asp Ser
180 185 190

His Arg Arg Glu Val Val Asn Leu Val His Asp Gln Leu Ile Ser Leu
195 200 205

Arg Gly Pro Glu Pro Asp
210

<210> 54
<211> 645
<212> DNA
<213> Streptomyces aizunensis

<400> 54
atgacgcatg agggcacccg gcactccacg agggagacca cccccgacga cgtcagcctg 60

atccagatcc ggcagccggc gatcccgagc agctaccgca tgatctgttt ccccagttcg 120

cggaactcct cgatctgcta tctggccatg tcggaactgc tgctgcccac cgtggaactg 180

ctcatcgtcc agtacccggc cctgacctcc gaggaggagc attcggccga ggaggacgcg 240

gcgctcgccg acaagatctt cgaagcggtc cggggctggg ccgaccgccc gctcgccctc 300

ttcgggcacc gcctcggtgc cgaactcgcc tacgcggtcg cccagcggct ggaacgggag 360

accgacgcgg caccctgac cctgttcgtc tccggacgca cgggaccggg ccaccgcggc 420

agcctcggcc cgcccgcgct caactgccgg gtcgtcgccc tggccgggta ccacgacccc 480

cgcgcacccc tggccggggt acgggcctgg cggcgctgca cggcgggacg gttcgacctg 540

gaggtctttc ccggcacccg cggctacctc gactcgcacc gccgcgaggt cgtcaacctc 600

gtgcacgacc agctgatttc gctccgcgga ccggagcccg actga 645

<210> 55
<211> 470
<212> PRT
<213> Streptomyces aizunensis

<400> 55

Val Arg Pro Met Thr Ala Lys Ile Phe Ala Val Asp Ser Val Arg Pro
1 5 10 15

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Ile Asp Glu Phe Glu Gln Asp Ala Leu Arg Val Ala Asp Val Ile Arg
            20                  25                  30

Glu Arg Gly Val Cys Leu Gly Asp Arg Val Met Leu Lys Ala Gly Asn
        35                  40                  45

Ser Ala Ser Tyr Val Cys Val Leu Tyr Ala Leu Met His Ile Gly Ala
    50                  55                  60

Ser Ile Val Leu Val Asp Gln Gln Glu His Lys Glu Glu Thr Arg Arg
65                  70                  75                  80

Ile Ala Leu Arg Thr Gly Val Lys Val Thr Phe Val Asp Asp Glu Thr
                85                  90                  95

Pro Ile Asp Gln Asp Ala Asp Pro Ile His Leu Tyr Glu Leu Met Val
            100                 105                 110

Ala Thr Gln Asn Arg Pro Pro Met Asp Ser Ala Leu Ser Phe Asp Ala
        115                 120                 125

Trp Gly Glu Leu Ser Asp Gly Leu Ile Met Trp Thr Ser Gly Ser Thr
    130                 135                 140

Gly Ser Pro Lys Gly Val Val Lys Ser Gly Gly Lys Phe Leu Ala Asn
145                 150                 155                 160

Leu Arg Arg Asn Ala His Gln Val Gly His Arg Pro Asp Asp Val Leu
                165                 170                 175

Met Pro Leu Leu Pro Phe Ala His Gln Tyr Gly Leu Ser Met Val Leu
            180                 185                 190

Ile Ala Trp Leu Thr Arg Cys Ser Leu Val Ile Ala Pro Tyr Arg Arg
        195                 200                 205

Leu Asp Arg Ala Leu Arg Met Ala Arg Asp Ser Gly Thr Thr Val Ile
    210                 215                 220

Asp Ala Thr Pro Ser Ser Tyr Arg Ser Ile Leu Gly Leu Val Thr Arg
225                 230                 235                 240

Lys Pro Ala Leu Arg Ala His Leu Ala Gly Thr Arg Met Phe Cys Val
                245                 250                 255

Gly Ala Ala Pro Leu Asp Ala Pro Leu Val Glu Ser Tyr Val Gln Glu
            260                 265                 270

Phe Gly Leu Pro Leu Leu Asp Ser Tyr Gly Ser Thr Glu Leu Asn Asn
        275                 280                 285

Ile Ala Phe Ala Thr Leu Asp Asn Pro Val Ser Cys Gly Arg Ala Met
    290                 295                 300

Glu Gly Ile Gly Leu Arg Ile Val Asp Glu Asp Gly Arg Glu Val Ala
305                 310                 315                 320

Ala Gly Gln Pro Gly Glu Ile Glu Val Asp Thr Pro Asp Ala Leu Glu
                325                 330                 335

Gly Gln Ile Ala Glu Asp Gly Ser Ile Ile Pro Ala Pro Thr Gly Trp
            340                 345                 350
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Gln Arg Thr Gly Asp Leu Gly His Leu Asp Ala Asp Gly Asn Leu Tyr
355 360 365

Val Leu Gly Arg Lys Phe Ala Val His Arg Met Gly Tyr Thr Leu Tyr
370 375 380

Pro Glu Leu Ile Glu Arg Lys Val Ala Ala Glu Gly Cys Pro Thr Arg
385 390 395 400

Ile Val Pro Leu Pro Asp Glu Leu Arg Gly Ser Gln Leu Val Phe Phe
405 410 415

Val Glu Asp Asp Glu Gln Arg Asp Ala Gly Tyr Trp Arg Glu Arg Leu
420 425 430

Cys Gly Leu Leu Pro Ala Phe Glu Gln Pro Asn Lys Val Val Val Leu
435 440 445

Glu Gln Phe Pro Leu Asn Arg Asn Gly Lys Pro Asp Lys Lys Glu Leu
450 455 460

Thr Arg Met Ala Ala Glu
465 470

<210> 56
<211> 1413
<212> DNA
<213> Streptomyces aizunensis

<400> 56
gtgcgaccga tgaccgcgaa gatctttgca gtcgactcgg tacgacccat agacgagttc 60

gagcaggacg ccctccgcgt cgccgatgtg atccgcgaac gcggagtctg tctcggcgac 120

cgggtcatgc tgaaggccgg caactcggcg agctacgtct gtgtgctgta cgcgctgatg 180

cacatcggcg cctcgatcgt cctcgtcgac cagcaggaac acaaggagga gacccgccgc 240

atcgcgctgc gcaccggcgt caaggtcacc ttcgtcgacg acgagacccc gatcgaccag 300

gacgccgacc ccatccacct gtacgaactc atggtggcca cccagaaccg tccgcccatg 360

gacagcgccc tgtcgttcga cgcctggggc gagctgtccg acggcctcat catgtggacc 420

tcgggctcca ccggatcgcc caagggcgtg gtgaagtccg gcgggaagtt cctggccaac 480

ctccggcgca acgcccacca ggtcggccac cgtcccgacg acgtcctgat gccgctgctg 540

ccgttcgccc accagtacgg cctgtcgatg gtcctcatcg cctggctcac ccgctgctcc 600

ctggtgatcg ccccctaccg gcgtctggac cgggcgctgc gcatggcccg cgactcgggc 660

accacggtca tcgacgcgac cccctccagc taccggagca tcctgggcct ggtgaccagg 720

aagcccgccc tgcgcgcgca cctggcgggc acccggatgt tctgtgtcgg cgcggccccg 780

ctcgacgcac cgctggtgga gagctacgta caggagttcg gcctgccgct gctcgacagc 840

tacggctcga ccgagctgaa caacatcgcc ttcgccaccc tcgacaaccc ggtctcctgc 900

ggccgtgcca tggagggcat cgggctccgg atcgtcgacg aggacggccg ggaggtggcg 960

gccgggcagc cgggcgagat cgaggtcgac acccccgacg cactcgaagg gcagatagcc 1020

gaggacggtt cgatcattcc ggcgcccacc ggctggcagc gcacgggcga cctcggccac 1080

ctcgacgcgg acggcaacct ctacgtcctg ggacgcaagt tcgccgtgca ccgcatgggc 1140

tacacgctct atcccgagct catcgagcgc aaggtcgccg ccgagggctg ccccacccgg 1200

atcgtgcccc tgcccgacga actgcgcggc tcccagctgg tgttcttcgt cgaggacgac 1260

gagcagcggg acgccggcta ctggcgggag cggctgtgcg gcctgctgcc cgccttcgag 1320

cagcccaaca aggtggtcgt cctggagcag ttcccgctca accgcaacgg caagccggac 1380

aagaaggagc tgacgcggat ggccgccgaa tag 1413

<210> 57
<211> 553
<212> PRT
<213> Streptomyces aizunensis

<400> 57

Met Thr Ser Phe Ser Pro Ala Pro Thr Thr Met Leu Val Pro Asp Phe
1 5 10 15

Pro Phe Ser Tyr Asp Gly Trp Leu Arg His Pro Ala Gly Leu Gly Ala
20 25 30

Leu Pro Pro Glu Arg Ala Gly Thr Pro Val Ala Val Val Gly Gly Gly
35 40 45

Met Ala Gly Met Thr Ala Ala Tyr Glu Leu Met Arg Leu Gly Leu Arg
50 55 60

Pro Val Val Tyr Glu Ala Glu Gln Leu Gly Gly Arg Met Arg Ser Val
65 70 75 80

Pro Phe Pro Gly Gln Pro Gly Leu Val Ala Glu Met Gly Ala Met Arg
85 90 95

Phe Pro Leu Ser Ala Arg Ser Leu Phe His Tyr Ile Asp Leu Leu Gly
100 105 110

Leu Arg Thr Ser Pro Phe Pro Asn Pro Leu Ala Ala Asn Thr Pro Ser
115 120 125

Thr Leu Ile Asp Leu Gly Gly Glu Arg His Thr Ala Arg Ser Ala Glu
130 135 140

Gln Leu Pro Asp Val Tyr Gln Glu Val Ala Ser Ala Trp Glu Lys Ala
145 150 155 160

Leu Gln Glu Arg Ala Glu Leu Ala Thr Met Arg Asp Ala Ile Gln Arg
165 170 175

Arg Asp Val Glu Thr Val Lys Gln Ile Trp Asn Arg Leu Val Arg Glu
180 185 190

Phe Asp Asp Gln Ser Phe Tyr Gly Phe Leu Ala Thr Ser Ser Ala Phe
195 200 205

Pro Ser Phe Arg His Arg Glu Ile Phe Gly Gln Val Gly Phe Gly Thr

210 215 220

Gly Gly Trp Asp Thr Asp Phe Pro Asn Ser Leu Leu Glu Ile Leu Arg
225 230 235 240

Val Val Tyr Thr Glu Ala Asp Asp Asn Gln Val Ala Ile Asp Gly Gly
245 250 255

Ser Gln Gln Val Pro Arg Gly Leu Trp Glu His Arg Pro Arg Gly Cys
260 265 270

Ala His Trp Pro Ala Gly Thr Ser Leu Ala Ser Leu His Gly Gly Thr
275 280 285

Ala Arg Pro Arg Val Arg Ala Val Ala Arg Asp Gly Asp Gly Phe Leu
290 295 300

Val Thr Asp Ala Asp Gly His Arg Glu Arg Phe Ala Ser Val Val Tyr
305 310 315 320

Thr Pro His Val Trp Thr Leu Leu Asn Arg Val Ala Cys Asp Pro Ala
325 330 335

Leu Leu Thr Gln Pro Leu Trp Thr Ala Val Glu Arg Thr His Tyr Met
340 345 350

Gly Ala Ser Lys Leu Phe Val Leu Ala Asp Arg Pro Phe Trp Asn Asp
355 360 365

Thr Asp Pro Arg Thr Gly Arg Pro Val Met Ser Met Thr Leu Thr Asp
370 375 380

Arg Met Pro Arg Gly Val Tyr Leu Phe Asp Asp Gly Pro Asp Arg Pro
385 390 395 400

Gly Val Met Cys Leu Ser Tyr Thr Trp Asn Asp Asp Ser Leu Lys Met
405 410 415

Ala Thr Leu Ser Ala Asp Glu Arg Leu Asp Val Leu Leu Glu Lys Leu
420 425 430

Gly Val Ile Tyr Pro Gly Val Asp Ile Arg Ser His Val Ile Gly Asp
435 440 445

Pro Ile Thr Ile Thr Trp Glu Ser Glu Pro His Phe Met Gly Ala Phe
450 455 460

Lys Ser Asn Leu Pro Gly Gln Tyr Arg Tyr Gln Arg Arg Leu Phe Thr
465 470 475 480

Gln Phe Met Gln Arg Gly Leu Pro Arg Ala Gln Arg Gly Phe Phe Leu
485 490 495

Cys Gly Asp Asp Val Ser Trp Thr Ala Gly Phe Ala Glu Gly Ala Val
500 505 510

Thr Thr Ala Leu Asn Ala Val Trp Gly Val Leu Asp His Leu Gly Gly
515 520 525

Ala Thr Pro Pro Gly Asn Pro Gly Pro Gly Asp Leu Phe Asp Ala Leu
530 535 540

Ala Pro Leu Asp Leu Pro Tyr Asp Ser

545 550

<210> 58
<211> 1662
<212> DNA
<213> Streptomyces aizunensis

<400> 58
atgacgtcat tcagcccggc tcccaccacc atgctcgtgc ccgacttccc gttctcctac 60

gacggctggc tgcgccatcc cgccggactc ggcgcccttc cgcccgagcg cgccggtacg 120

ccggtggccg tggtcggcgg gggaatggcg ggaatgaccg ccgcgtacga actgatgcgg 180

ctgggcctgc gcccggtcgt atacgaggcg gagcaactgg gtggccggat gcggtcggtg 240

cccttccccg ggcagcccgg cctcgtggcg gagatggggg cgatgcgctt cccgctctcc 300

gcgcgctcgc tgttccacta catcgacctg ctggggctgc gcaccagccc cttccccaac 360

ccgctggcgg cgaacacccc gagcaccctc atcgacctcg gcggcgaacg gcacaccgcg 420

cggtccgcgg agcaactccc ggatgtgtac caggaggtgg cctcggcctg ggagaaggcc 480

ctgcaggagc gggccgagct ggccaccatg cgggacgcca tccagcgccg cgacgtcgag 540

acggtgaagc agatatggaa ccgactggtc agggagttcg acgaccagtc cttctacggg 600

ttcctggcga ccagttcggc gttcccgtcg ttccggcacc gggagatctt cggccaggtg 660

gggttcggca ccggcggctg ggacaccgac ttccccaact cgctcctcga aatcctgcgc 720

gtggtctaca ccgaggcgga cgacaaccag gtcgccatcg acggcggctc ccagcaggtg 780

ccgcgcgggc tgtgggagca ccggccgcgg ggctgcgcgc actggccggc cggcacctct 840

ctcgcctcgc tgcacggagg gacggcccgg ccacgggtgc gggccgtcgc cagggacggt 900

gacggcttcc tcgtcaccga cgccgacgga caccgggagc ggttcgcctc ggtggtgtac 960

accccgcacg tgtggaccct gctgaaccgg gtcgcgtgcg atccggcgct gctgacgcag 1020

ccgctgtgga ccgccgtgga gcgcacccac tacatggggg cctccaaact gttcgtcctg 1080

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acgctcacgg accggatgcc gcgcggggtg tatctcttcg acgacggccc ggaccgcccc 1200

ggcgtgatgt gcctgtcgta cacctggaac gacgactcgc tgaagatggc gacgctgagc 1260

gccgacgagc ggctggacgt gctgctggag aagctcggcg tgatctatcc cggcgtcgac 1320

atccgctccc acgtcatcgg tgatccgatc accatcacct gggagagcga gccgcatttc 1380

atgggcgcgt tcaagtccaa tctgccgggc cagtaccgct accagcgcag gctgttcacg 1440

cagttcatgc agcgcgggct gccgcgggcc cagcgcggct tcttcctgtg cggcgacgac 1500

gtgtcctgga cggcgggctt cgcggagggc gcggtcacga cggcgctgaa cgcggtgtgg 1560

ggcgtactgg accacctggg cggggccacg ccgcccggca accccggccc cggcgacctc 1620

ttcgacgcgc tggctccccc cgacctcccc tacgacagct ga 1662

<210> 59
<211> 231
<212> PRT
<213> Streptomyces aizunensis

<400> 59

Met Ile Glu Glu Leu Leu Pro Glu Gly Ala Val Ala Ser Glu Ala Phe
1 5 10 15

Gly Pro Asp Gly Ser Ala Leu Leu Tyr Pro Glu Glu Ala Ala Leu Val
20 25 30

Ala Met Thr Thr Asp Leu Arg Arg Glu Glu Phe Ala Thr Val Arg Ala
35 40 45

Cys Ala Arg Arg Ala Leu Ala Ala Leu Gly Leu Pro Ser Ala Pro Val
50 55 60

Leu Pro Gly Val Arg Asn Val Pro Gln Trp Pro Asp Gly Val Val Gly
65 70 75 80

Ser Met Thr His Cys Ala His Tyr Arg Ala Ala Val Leu Ala Arg Asp
85 90 95

Thr Asp Leu Ala Met Ile Gly Ile Asp Ala Glu Pro Asp Leu Pro Leu
100 105 110

Pro Glu Gly Val Leu Glu Ser Ile Ala Leu Pro Arg Glu Leu Ala Trp
115 120 125

Ala Arg Ser Gly Gly Tyr Gly Ser Ser Leu Arg Arg Asp Arg Leu Leu
130 135 140

Phe Ser Ala Lys Glu Ala Val Tyr Lys Thr Trp Tyr Pro Leu Leu Gly
145 150 155 160

Thr Glu Leu Asp Phe Asp Asp Ala Asp Ile Thr Phe Arg His Glu Val
165 170 175

Gly Pro Asn Gly Arg Pro Gln Gly Thr Phe Thr Ala Arg Ile Leu Arg
180 185 190

Pro Leu Pro Gly Pro Asp Gly Arg Pro Val Asp Arg Phe Thr Gly Arg
195 200 205

Trp Leu Ser Asp Arg Gly Ile Ile Val Thr Val Ile Thr Leu Pro Ala
210 215 220

Tyr Arg Val Ala Thr Thr Arg
225 230

<210> 60
<211> 696
<212> DNA
<213> Streptomyces aizunensis

<400> 60
atgatcgagg aactgctccc cgaaggggcg gtcgcgagcg aggccttcgg gccggacgga 60

tcggcgctgc tctaccccga ggaggcggcg ctggtcgcca tgacgacgga tctgcgccgc 120

gaggagttcg ccaccgtccg ggcgtgtgcg cggcgcgccc tcgccgcact ggggctgccg 180

tctgctcccg tactgcccgg ggtgcgcaat gtgccccagt ggcccgacgg cgtggtcggc 240

agcatgaccc attgcgccca ctaccgggcc gccgtcctgg cgcgggacac ggacctggcg 300

atgatcggca tcgacgccga acccgatctg cccctgcccg aaggggtgct ggagtcgatc 360

gcgctgccgc gcgagctggc ctgggcgcgc tcgggaggat acggctccag cctgcgccgg 420

gaccgtctgc tcttcagtgc caaggaagcg gtctacaaga cctggtaccc gctgctgggc 480

accgagctgg acttcgacga cgccgacatc accttccgcc acgaggtcgg cccgaacggc 540

cggccgcagg gcacgttcac ggcccgcatt ctgcgtccgc tgcccggtcc cgacgggcgg 600

ccggtggaca ggttcacggg ccgctggctt tcggaccgcg gcatcatcgt cacggtcatc 660

accctgcccg cctatcgcgt ggcgaccacg cggtaa 696

<210> 61
<211> 306
<212> PRT
<213> Streptomyces aizunensis

<400> 61

Met Ser His Thr Pro Pro Asp His Val Thr Ala Glu Ala Gly Pro Arg
1 5 10 15

Leu Leu Ala Val Ser Asp Leu His Ile Gly Met Ala Asp Asn Arg Pro
20 25 30

Ile Thr Glu Ser Leu Arg Pro Ser His Glu Asp Asp Trp Leu Ile Val
35 40 45

Ala Gly Asp Val Gly Glu Leu Thr Glu Asp Ile Glu Trp Ala Leu Arg
50 55 60

Leu Leu Ala Gly Arg Phe Ala Lys Val Val Trp Ala Pro Gly Asn His
65 70 75 80

Glu Leu Trp Thr Pro Arg Glu Asp Thr Val Gln Leu Arg Gly Glu Glu
85 90 95

Arg Tyr Arg Tyr Leu Val Glu Met Cys Arg Gly Leu Gly Val Val Thr
100 105 110

Pro Glu Asp Pro Trp Pro Val Trp Glu Gly Pro Gly Gly Pro Val Ala
115 120 125

Val Ala Pro Leu Phe Leu Leu Tyr Asp Tyr Thr Phe Arg Val Ala Gly
130 135 140

Thr Ser Thr Lys Glu Glu Ser Leu Ala Arg Ala His Glu Ala Gly Val
145 150 155 160

Val Cys Thr Asp Glu Tyr Leu Leu His Pro Asp Pro Tyr Arg Ser Arg
165 170 175

Asp Asp Trp Cys Arg Ala Arg Val Ser Ala Thr Arg Arg Arg Leu Val

180 185 190

Ala His Asp Pro Ser Val Pro Leu Val Leu Val Asn His Phe Pro Leu
195 200 205

Val Arg Glu Pro Thr Asp Val Leu Trp His Pro Glu Phe Ala Gln Trp
210 215 220

Cys Gly Thr Val Leu Thr Ala Asp Trp His Arg Arg Phe Ser Thr Ala
225 230 235 240

Ala Val Val Tyr Gly His Leu His Ile Pro Arg Thr Thr Trp Tyr Asp
245 250 255

Gly Val Arg Phe Glu Glu Val Ser Ile Gly Tyr Pro Arg Glu Trp Arg
260 265 270

Arg Arg Gly His Pro Arg Gly Leu Leu Arg Gln Ile Leu Pro Tyr Thr
275 280 285

Pro Glu Pro Glu Pro Glu Thr Pro Ala Arg Thr Glu Pro Gln Glu Thr
290 295 300

Arg Ala
305

<210> 62
<211> 921
<212> DNA
<213> Streptomyces aizunensis

<400> 62
atgtcgcaca caccgcctga ccacgtcacc gcggaggccg gtccccggct gctcgcggtg 60

agcgatctgc acatcgggat ggccgacaac cggcccatca ccgagtcgct gcgcccctcc 120

cacgaggacg actggctgat cgtggccggg gacgtcggcg agctgaccga ggacatcgag 180

tgggcgctgc gcctgctggc cgggcggttc gccaaggtcg tgtgggcgcc gggcaaccac 240

gagctgtgga ccccgcgcga ggacacggtg cagttgcgcg gcgaggagcg ctaccggtac 300

ctggtggaga tgtgccgggg gctgggcgtg gtcacgcccg aggacccgtg gccggtgtgg 360

gagggtcccg gcggcccggt cgcggtcgct ccgctgttcc tgctgtacga ctacacgttc 420

cgggtggcgg gcacctcgac caaggaggag tcgctggccc gggcgcacga ggcgggtgtg 480

gtgtgcacgg acgagtacct gctccacccc gacccgtacc ggagccgtga cgactggtgc 540

cgggcccgtg tctccgcgac ccggcggcgg ctggtggcgc acgatccgtc ggtgccgctg 600

gtgctggtca accacttccc gctggtgcgc gagcccacgg acgtgctgtg gcacccggag 660

ttcgcgcagt ggtgcggcac ggtgctgacc gccgactggc accgccggtt cagcacggcc 720

gccgtggtgt acgggcacct gcacatcccc aggaccacct ggtacgacgg ggtccggttc 780

gaggaggtgt cgatcggcta cccgcgcgag tggcgccggc gcggccatcc caggggctg 840

ctgcggcaga tcctgccgta caccccggaa ccggaaccgg agacccccgc caggaccgaa 900

ccgcaggaga cacgggcatg a 921

<210> 63
<211> 998
<212> PRT
<213> Streptomyces aizunensis

<400> 63

Met Gly Lys Ala Phe Ala Ala Val Leu Val Glu Arg Asp Glu Gln Ile
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Gly Arg Leu Thr Ser Phe Val Ser Gly Thr Ala Ser Gly Ala Val Ala
20 25 30

Ala Ala Ala Ala Gly Thr Gly Arg Ile Ala Val Ile Asp Gly Pro Val
35 40 45

Ala Ser Gly Lys Thr Ala Leu Leu His Arg Val Leu Glu Leu Thr Ala
50 55 60

Gly Ala Gly Pro Arg Val Ile Thr Ala Val Thr Ser Pro Ala Glu Gln
65 70 75 80

Ser Met Pro Phe Gly Val Val Glu Gln Leu Val Arg Asp Ala Gln Ala
85 90 95

Val Ser Asp Arg Leu Pro Leu His Pro Ser Ala Gly Pro Asp Ala Ala
100 105 110

Leu Asp Ser Thr Pro Arg Pro Glu Ser Glu Pro Val Pro Ala Glu Ile
115 120 125

Leu Met Ala Phe His Leu Gln Leu Ala Glu Val Cys Ala Arg Gly Pro
130 135 140

Val Leu Ile Val Val Asp Asp Val Gln Tyr Ala Asp Pro Gln Ser Leu
145 150 155 160

Tyr Cys Leu Ala His Met Leu Leu Arg Ala Ser Ala Ser Gly Ala Val
165 170 175

Val Ser Leu Leu Val Ser Arg Gly Pro Asp Val Gly Gly Thr Pro Pro
180 185 190

Val Val Leu Glu Glu Leu Leu Tyr Gln Leu Arg Gly Leu His Val Arg
195 200 205

Leu Gly Pro Leu Ser Val Asp Gly Val Gly Arg Leu Leu Ala Ala Arg
210 215 220

Asp Pro Glu Ala Gly Ala Arg Lys Pro Ala Ala Pro Ala Ser Trp Ser
225 230 235 240

Thr Pro Leu Ala Ala Ser Val His Ala Ala Thr Gly Gly Asn Pro Leu
245 250 255

Leu Val His Gly Leu Ile Glu Asp Arg Leu Ser Arg Gln Arg Leu Leu
260 265 270

Ala Ala Gly Pro Gly Ala Gly Pro Ala Ser Ala Glu Ala Gly Asn Gly
275 280 285

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Thr Gly Asn Glu Thr Glu Asp Ala Leu Ala Gly Thr Pro His Ala Gly
    290                 295                 300

Asp Gln Phe Leu Gln Ser Ala Leu Ile Cys Val His Arg Thr Gly Ser
305                 310                 315                 320

Asp Gly Leu Arg Val Ala Gln Gly Ile Ala Leu Leu Gly Gly Ala Gly
                325                 330                 335

Ser Thr Ser Leu Leu Ala Arg Leu Val Glu Val Glu Glu Trp Thr Val
            340                 345                 350

Glu Gln Val Val Thr Ala Leu Asn Glu Ala Gly Val Leu Glu Lys Ser
        355                 360                 365

Val Phe Arg His Gly Gly Val Gln Thr Ala Val Val Glu Ser Leu Thr
    370                 375                 380

Asp Glu Ala Ala Thr Arg Leu Arg Gln Arg Ala Ala Val Leu Leu Tyr
385                 390                 395                 400

Glu Asp Gly Ala Ala Pro Leu Thr Ile Ala Ala Gln Leu Leu Ser His
                405                 410                 415

Glu Met Ser Ala Pro Asp Glu Glu Trp Val Pro Arg Val Leu Ser Glu
            420                 425                 430

Ala Ala Arg Ala Ala Leu Cys Thr Gln Gln Val Glu Phe Ala Val Arg
        435                 440                 445

Cys Leu Arg Met Ala Glu Ser Cys Cys Arg Asp Glu Thr Glu Arg Met
    450                 455                 460

Leu Leu Arg Ala His Leu Ala Lys Tyr Ile Trp Arg Val Gln Pro Ser
465                 470                 475                 480

Ala Trp Pro Gln Gln Leu Arg Pro Leu Leu Gly Ala Val Arg Asp Gly
                485                 490                 495

Leu Leu Pro Pro Val Asp Thr Val Arg Leu Val Tyr Asp Leu Leu Trp
            500                 505                 510

Asn Gly Trp Met Asp Asp Ala Ala Ala Ala Ile Arg Gln Val Val Asp
        515                 520                 525

Val Leu His Arg Ser Pro Asp Ala Arg Leu Ala Thr Glu Leu Gly Ala
    530                 535                 540

Leu Arg Leu Ala Leu Ala Ser Thr Tyr Pro Ala Val Leu Glu His Leu
545                 550                 555                 560

Gly Asp Val Pro Ala Pro Ala Arg Gly Ala Gly Glu Arg Leu Ser Ala
                565                 570                 575

Gln Glu Glu Ile Leu Leu Thr Ser Ala Arg Val Leu His Gly Val Leu
            580                 585                 590

Arg Gly Gly Asp Gly Ala Arg Asp Thr Asp Pro Asp Thr Asp Ala Glu
        595                 600                 605

Asp Phe Ala Glu Ser Ala Glu Arg Thr Leu Ala Gly Thr Arg Leu Thr
    610                 615                 620
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Glu Glu Thr His Leu Gly Leu Arg Ala Cys Leu Leu Thr Leu Phe Tyr
625 630 635 640

Ala Asp Arg Pro Ala Thr Ala Thr Leu Trp Ala Asp Arg Leu Leu Val
645 650 655

Glu Ala Ala Asp Arg Lys Ala Pro Gly Trp Thr Ala Val Leu Arg Ala
660 665 670

Ile Arg Ala His Met Ser Leu Arg Arg Gly His Leu Val Glu Ala Arg
675 680 685

Arg Leu Ala Glu Gln Ala Leu Asp Gln Leu Pro Pro His Gly Trp Gly
690 695 700

Val Gly Ile Gly Met Pro Leu Ser Ala Leu Ile Glu Ala Arg Thr Ala
705 710 715 720

Met Gly Asp His Glu Ala Ala Ala Glu Leu Leu Asp Arg Pro Val Pro
725 730 735

Glu Asp Met Leu Thr Thr Arg His Gly Leu His Tyr Leu Tyr Ala Arg
740 745 750

Gly Arg His Gln Leu Ala Thr Gly Arg His His Ala Ala Leu Thr Asp
755 760 765

Phe Thr Ala Cys Gly Glu Leu Met Arg Arg Trp Gly Met Asp Arg Ser
770 775 780

Thr Leu Val Pro Trp Arg Val Gly Val Ala Glu Ala Arg Leu Ala Leu
785 790 795 800

Gly Ser Arg Glu Glu Ala Glu Arg Phe Ala Arg Glu Gln Leu Ala Gly
805 810 815

Asp Ala Gly Gln Arg Val Arg Gly His Ala Leu Arg Val Leu Ala Ala
820 825 830

Ala Arg Pro Leu Arg Glu Arg Pro Ala Leu Leu Ala Gln Ala Val Ala
835 840 845

Leu Leu Gln Glu Asp Ser Asp Trp Tyr Glu Leu Ala Arg Ala Leu Thr
850 855 860

Asp Leu Gly Gln Ala Tyr Lys Gln Leu Gly Asp Pro Ser Gln Gly Lys
865 870 875 880

Val His Thr Arg Arg Ala Trp Arg Ile Ala Lys Gly Cys Gly Ala Arg
885 890 895

Glu Leu Tyr Arg Ser Leu His Pro Ser Gln Pro Pro Ala Pro Ser Ala
900 905 910

Pro Ala Ala Gln Pro Arg Pro Ala Ala Pro Ala Asp Ala Ala Arg Pro
915 920 925

Pro Ser Ala Ala Val Ser Ser Leu Thr Asp Ala Glu Arg Lys Val Ala
930 935 940

Ala Leu Ala Ala His Gly Tyr Thr Asn Arg Glu Ile Gly Ala Lys Leu
945 950 955 960

Phe Ile Thr Val Ser Thr Val Glu Gln His Leu Thr Arg Val Tyr Arg
965 970 975

Lys Ile Asn Ile Thr His Arg Gln Asp Leu Pro Val Ser Leu Asp Thr
980 985 990

Asp Val Ala His Thr Ala
995

<210> 64
<211> 2997
<212> DNA
<213> Streptomyces aizunensis

<400> 64
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tccttcgtat ccggcaccgc ttccggcgcg gtggccgcgg ccgccgccgg gaccggccgg 120

atcgccgtga tcgacgggcc ggtggcttcg ggaaagacgg cgctcctcca tcgcgtgctg 180

gagctgacgg ccggggcggg gccacgcgtc atcaccgcgg tcacctcgcc cgcggaacag 240

tccatgccgt tcggcgtggt ggagcagctg gtgcgcgacg cgcaggccgt ctccgaccgg 300

ctgccgctcc acccgtcggc cggaccggac gcggcgctgg actcgacgcc gcggccggag 360

tcggagccgg tacccgccga gatcctcatg gccttccacc tccagctcgc cgaggtctgc 420

gcgcgcgggc cggtcctgat cgtcgtcgac gacgtgcagt acgccgaccc gcagtcgctg 480

tactgcctcg cccacatgct gctccgggcg tccgcctccg gcgccgtggt gtcgctgctg 540

gtgagccgcg gcccggacgt gggcggcacg ccgcccgtcg tcctggagga attgctctac 600

caactgcggg gcctgcacgt ccggctgggt ccgctcagtg tcgacggcgt cggccggctg 660

ctcgcggccc gggacccgga ggccggagcg aggaagcccg cggcccctgc ctcgtggtcc 720

accccgctgg ccgcctccgt ccacgcggcg accggcggca acccccctgct cgtccacggg 780

ctcatcgagg accgcctcag ccgacagcga ctcttggcgg ccggccccgg tgcgggcccc 840

gcgtcggccg aggccgggaa cgggaccggg aacgagaccg aggacgccct cgcgggaacg 900

ccccacgcgg gcgaccagtt cctgcagagc gcgctgatct gtgtgcaccg cacgggatcc 960

gacggcctgc gggtcgccca gggcatcgcc ctgctgggcg gcgccggatc gacgtcactg 1020

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cagcaggtcg agttcgcggt gcgctgtctg cggatggcgg agagctgctg ccgcgacgag 1380

acggagcgga tgctgctgcg ggcgcatctg gccaagtaca tctggcgggt ccagccgtcc 1440

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ggcagccgcg aagaggcgga acgtttcgcc agggagcagc tcgccgggga cgccggtcag 2460

cgggtgcgcg gacacgcgct gcgggtgctc gcggcggccc gtccgctgcg cgagcgtccg 2520

gcgctgctcg cgcaggcggt cgcgctgctc caggaggaca gcgactggta cgagctggcg 2580

cgggcgctga ccgatctcgg gcaggcgtac aagcagctcg gcgacccgtc ccagggcaag 2640

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tccctgcatc cgagccagcc cccggcgccc tcggcgcccg ccgcgcagcc gcgccccgcc 2760

gccccggccg atgccgcgcg ccccccgtcc gccgcggtgt cgtcgctgac ggacgcggag 2820

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ttcatcaccg tcagcacggt cgagcagcat ctgacccggg tctaccggaa gatcaacatc 2940

acgcaccgcc aggacctgcc ggtcagtttg gataccgatg tcgcacacac cgcctga 2997

<210> 65
<211> 518
<212> PRT
<213> Streptomyces aizunensis

<400> 65

Met Thr Thr Thr Val Ile Gly Lys Val Ala Glu Leu Tyr Ala Val Arg
1 5 10 15

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Glu Glu Ala Val Arg Gly Pro Ser Asp Arg Ala Thr Glu Ala Gln His
            20                  25                  30

Ala Lys Gly Lys Leu Thr Ala Arg Glu Arg Ile Gly Leu Leu Leu Asp
        35                  40                  45

Glu Gly Ser Phe Arg Glu Val Glu Gln Leu Arg Arg His Arg Ala Ser
    50                  55                  60

Gly Phe Gly Leu Glu Ala Lys Arg Pro Tyr Thr Asp Gly Val Ile Thr
65                  70                  75                  80

Gly Trp Gly Thr Ile Glu Gly Arg Thr Val Phe Val Tyr Ala His Asp
                85                  90                  95

Phe Arg Ile Phe Gly Gly Ala Leu Gly Glu Ala His Ala Thr Lys Ile
            100                 105                 110

His Lys Ile Met Asp Met Ala Ile Ala Ala Gly Ala Pro Leu Val Ser
        115                 120                 125

Leu Asn Asp Gly Ala Gly Ala Arg Ile Gln Glu Gly Val Ser Ala Leu
    130                 135                 140

Ala Gly Tyr Gly Gly Ile Phe Gln Arg Asn Thr Lys Ala Ser Gly Val
145                 150                 155                 160

Ile Pro Gln Ile Ser Val Met Leu Gly Pro Cys Ala Gly Gly Ala Ala
                165                 170                 175

Tyr Ser Pro Ala Leu Thr Asp Phe Val Phe Met Val Arg Glu Thr Ser
            180                 185                 190

Gln Met Phe Ile Thr Gly Pro Asp Val Val Lys Ala Val Thr Gly Glu
        195                 200                 205

Glu Ile Thr Gln Asn Gly Leu Gly Gly Ala Asp Val His Ala Gly Thr
    210                 215                 220

Ser Gly Val Ala His Phe Ala Tyr Asp Asp Glu Glu Thr Cys Ile Ala
225                 230                 235                 240

Glu Val Arg Tyr Leu Leu Ser Met Leu Pro Ser Asn Asn Arg Glu Asn
                245                 250                 255

Pro Pro Ala Val Gln Ala Gly Asp Pro Ala Asp Arg Arg Cys Asp Ala
            260                 265                 270

Leu Leu Asn Leu Val Pro Val Asp Gly Asn Arg Pro Tyr Asp Met Leu
        275                 280                 285

Lys Val Ile Glu Glu Ile Val Asp Asp Gly Asp Tyr Val Glu Ile His
    290                 295                 300

Glu Gly Trp Ser Arg Asn Ile Ile Cys Ala Leu Ala Arg Leu Asp Gly
305                 310                 315                 320

Gln Val Val Ala Ile Val Ala Asn Gln Pro Gln Phe Leu Ala Gly Val
                325                 330                 335

Leu Asp Ile Gly Ala Ser Glu Lys Ala Ala Arg Phe Val Gln Met Cys
            340                 345                 350
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Asp Ala Phe Asn Ile Pro Ile Val Thr Leu Leu Asp Val Pro Gly Phe
        355                 360                 365

Leu Pro Gly Val Asp Gln Glu His Gly Gly Ile Ile Arg His Gly Ala
    370                 375                 380

Lys Leu Leu Tyr Ala Tyr Cys Asn Ala Thr Val Pro Arg Ile Ser Leu
385                 390                 395                 400

Ile Leu Arg Lys Ala Tyr Gly Gly Ala Tyr Ile Val Met Asp Ser Gln
                405                 410                 415

Ser Ile Gly Ala Asp Leu Thr Tyr Ala Trp Pro Thr Asn Glu Ile Ala
            420                 425                 430

Val Met Gly Ala Glu Gly Ala Ala Asn Val Ile Phe Arg Arg Gln Ile
        435                 440                 445

Ala Glu Ser Gly Asp Pro Glu Ala Met Arg Ala Arg Met Val Lys Glu
    450                 455                 460

Tyr Lys Ala Glu Leu Met His Pro Tyr Tyr Ala Ala Glu Arg Gly Leu
465                 470                 475                 480

Val Asp Asp Val Ile Asp Pro Ala Glu Thr Arg Glu Val Leu Ile Ala
                485                 490                 495

Ser Leu Ala Met Leu Arg Thr Lys His Ala Asp Leu Pro Pro Arg Lys
            500                 505                 510

His Gly Asn Pro Pro Gln
        515
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<210> 66
<211> 1557
<212> DNA
<213> Streptomyces aizunensis

<400> 66

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cgtgggccga gcgaccgggc gacggaggcg cagcacgcga agggaaagct gaccgcccgt    120

gagcggatcg gccttttgct ggacgagggt tcgttcaggg aggtcgaaca gctgcggcgg    180

caccgggcca gcggtttcgg cctggaggcg aagaggcctt acacggatgg tgtgatcacc    240

ggttggggca ccatcgaggg ccgtacggtc ttcgtctacg cgcacgactt ccgcatcttc    300

ggcggggcgc tgggcgaggc ccacgccacg aagatccaca agatcatgga catggcgatc    360

gccgcgggtg ctccgctggt ctcgctgaac gacggcgcgg gcgcccgtat ccaggagggc    420

gtctcggcgc tggccggtta cggcggcatc ttccagcgca acaccaaggc gtccggggtc    480

atcccgcaga tcagtgtgat gctcggcccg tgcgcgggcg gcgcggccta ttcgccggcg    540

ctgacggact tcgtgttcat ggtccgtgag acctcgcaga tgttcatcac cggtccggac    600

gtggtcaagg ccgtcaccgg cgaggagatc acgcagaacg ggctcggcgg cgcggacgtg    660

cacgccggga cctcgggcgt cgcgcacttc gcgtacgacg acgaggagac ctgcatcgcg    720
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gaggtccgct atctgctgtc gatgctcccc tccaacaacc gggagaaccc gcccgccgtc 780

caggccgggg acccggccga ccggcgctgc gacgccctgc tgaacctcgt accggtggac 840

gggaaccgtc cgtacgacat gctcaaggtc atcgaggaga tcgtcgacga cggcgactac 900

gtcgagatcc acgagggctg gtcccgcaac atcatctgcg cgctggcccg tctggacggc 960

caggtggtcg ccatcgtcgc caaccagccg cagttcctgg ccggcgtgct ggacatcggg 1020

gcatcggaga aggccgcgcg cttcgtgcag atgtgcgacg ccttcaacat cccgatcgtg 1080

acactgctcg atgtgcccgg cttcctgccg ggcgtcgacc aggagcacgg cgggatcatc 1140

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gacctcacct acgcctggcc gaccaacgag atcgcggtga tgggcgccga gggcgccgcc 1320

aacgtcatct tccgccggca gatcgccgag tccggggacc ccgaggcgat gcgcgcgcgg 1380

atggtcaagg agtacaaggc cgagctgatg cacccctact acgcggccga gcggggcctg 1440

gtcgacgacg tcatcgaccc tgccgagacc cgcgaggtgc tgatcgcctc cctcgccatg 1500

ctccgcacga agcacgcgga cctgccgccg cgcaaacacg gcaaccccgc gcagtga 1557

<210> 67
<211> 329
<212> PRT
<213> Streptomyces aizunensis

<400> 67

Met Thr Ala His Pro Asn Gly Val Thr Pro Pro Leu Pro Pro Thr Glu
1 5 10 15

Thr Asp Arg Thr Leu His Phe Ala Gly Pro Ala Thr Phe Gly Arg Ile
20 25 30

Pro Arg Ile Asp Gln Val Glu Lys Thr Asp Ile Ala Val Val Gly Val
35 40 45

Pro Phe Asp Ser Gly Val Thr Tyr Arg Pro Gly Ala Arg Phe Gly Gly
50 55 60

Asn Ala Ile Arg Glu Ala Ser Arg Thr Leu Arg Pro Tyr Asn Pro Ala
65 70 75 80

Gln Asn Val Tyr Pro Phe His Phe Ser Gln Val Ala Asp Ala Gly Asp
85 90 95

Ile Ser Ala Asn Pro Phe Asp Leu Asn Asp Ala Val Glu Thr Ile Glu
100 105 110

Ala Ala Ala Asp Asp Leu Ile Ser Ser Gly Ala Arg Leu Met Thr Leu
115 120 125

Gly Gly Asp His Thr Ile Ala Leu Pro Met Leu Arg Ala Val Ala Lys
130 135 140

Lys His Gly Pro Leu Ala Val Leu His Phe Asp Ala His Leu Asp Thr
145 150 155 160

Trp Asp Asp Tyr Phe Gly Gln Gln Tyr Thr His Gly Met Pro Phe Arg
165 170 175

Arg Ala Val Glu Glu Gly Ile Leu Asp Thr Ser Ala Leu Ser His Val
180 185 190

Gly Thr Arg Gly Pro Ile Tyr Gly Lys Lys Asp Leu Asp Asp Asp Glu
195 200 205

Lys Leu Gly Phe Gly Ile Val Thr Ser Ala Asp Val Met Arg Arg Gly
210 215 220

Val Asp Glu Val Ala Gln Gln Leu Arg Glu Arg Val Gly Asp Arg Pro
225 230 235 240

Leu Tyr Ile Ser Ile Asp Ile Asp Val Leu Asp Pro Ala His Ala Pro
245 250 255

Gly Thr Gly Thr Pro Glu Ala Gly Gly Leu Thr Ser Arg Glu Leu Leu
260 265 270

Glu Ile Leu Arg Gly Leu Ala Asp Cys His Leu Val Ser Ala Asp Ile
275 280 285

Val Glu Val Ala Pro Ala Tyr Asp His Ala Asp Ile Thr Ser Val Ala
290 295 300

Ala Ser His Ala Ala Tyr Glu Leu Ile Ser Ile Met Ser Lys Gln Ile
305 310 315 320

Ala Pro Val Arg Trp Gly Ala Thr Gln
325

<210> 68
<211> 990
<212> DNA
<213> Streptomyces aizunensis

<400> 68
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ctgcacttcg cgggccccgc gacgttcggc cgcatcccgc ggatcgacca ggtggagaag 120

accgacatcg ccgtggtcgg cgtgcctttc gacagcggcg tcacctatcg gccgggcgcc 180

cgcttcggcg gcaacgccat ccgggaggcg tcccgcaccc tgcgtcccta caacccggcg 240

cagaacgtct acccttcca cttcagtcag gtcgcggacg ccggtgacat cagcgccaac 300

cccttcgacc tgaacgacgc cgtggagacg atcgaggcgg ccgccgacga cctgatctcc 360

agcggcgccc gtctgatgac gctgggcggc gaccacacca tcgccctgcc gatgctgcgt 420

gccgtggcga agaagcacgg tcccctcgcc gtcctgcact tcgacgccca tctggacacc 480

tgggacgact acttcgggca gcagtacacc cacggcatgc cgttccgccg cgccgtggag 540

gagggcatcc tcgacacctc cgccctctcc cacgtcggca cgcgcggccc gatctacggc 600

aagaaggatc tcgacgacga cgagaagctc ggcttcggca tcgtcacctc ggccgatgtg 660

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ctgtacatct ccatcgacat cgacgtcctg gacccggcgc acgccccggg caccggcacc 780

cccgaggccg gcggcctcac ctcccgcgag ctgctggaga tcctgcgcgg gctcgccgac 840

tgccacctgg tctccgcgga catcgtggag gtcgctccgg cctacgacca cgccgacatc 900

acctcggtgg cggcgtccca cgctgcctac gagctgatca gcatcatgtc caagcagata 960

gccccggtcc gctggggtgc gacgcagtaa 990

<210> 69
<211> 521
<212> PRT
<213> Streptomyces aizunensis

<400> 69

Val Thr Pro Gln Asp His Trp Trp Ser Ala Ser Gln Ser Tyr Val Ser
1 5 10 15

Asp Ile Leu Ser Val Phe Ala Ala Ala Pro Asp Arg Pro Ala Val Asn
20 25 30

Trp Arg Gly Glu Thr Ala Ser Gly Gly Glu Leu Ile Arg Ser Val Thr
35 40 45

Glu Ala Phe His Ala Leu His Asp Ser Gly Val Arg Ala Gly Asp Val
50 55 60

Val Ala Ile Leu Val Ala Pro Asn Ser Pro Glu Met Leu Thr Ala Arg
65 70 75 80

Tyr Ala Ala His Leu Leu Gly Gly Ala Val Cys Tyr Leu Arg Ser Thr
85 90 95

Asn Pro Gly Thr Ser Glu Val Ala Leu Pro Leu Asp Gln Gln Ile Arg
100 105 110

Ile Leu Arg Asp Thr Glu Ala Val Thr Val Tyr Thr Asp Ala Glu Asn
115 120 125

Ala Pro Arg Ala Ala Glu Leu Ala Ala Gly Ala Ser Gly Leu Pro Val
130 135 140

Thr Cys Leu Thr Gly Glu Ala Arg Lys Arg Glu Ser Ala Glu Asp Ala
145 150 155 160

Pro Arg Ala Leu Pro Trp Ala Pro Asp Ala Leu Ala Leu Ile Thr Phe
165 170 175

Thr Ser Gly Ser Thr Gly Arg Pro Lys Gly Ile Arg Leu Ala Gly Arg
180 185 190

Ala Trp Asn Gly Leu Val Gln Gly Met Val Ala Ala Gly Gly Glu Ala
195 200 205

Glu Gly Val Lys Leu Leu Val Thr Thr Pro Leu Ser His Thr Val Gly
210 215 220

```
Ser Met Ala Asp Thr Ala Leu Ala Leu Gly Gly Glu Val Tyr Leu His
225                 230                 235                 240

Glu Asn Phe Asn Ala Glu Gln Phe Val Asn Thr Val Ala Asp Glu Gly
                245                 250                 255

Ile Ala Trp Thr Phe Met Ala Thr Val His Leu Phe Gln Leu Leu Asp
            260                 265                 270

His Leu Glu Glu Arg Gly Leu Lys Asp Val Glu Glu Gly Arg Leu Ala
        275                 280                 285

Pro Leu Gln Arg Leu Ile Tyr Ser Gly Ser Ala Ala Ala Pro Ala Arg
    290                 295                 300

Ile Ala Gln Ala Val Lys Ala Phe Gly Leu Ile Ile Val Gln Ala Tyr
305                 310                 315                 320

Gly Thr Gly Glu Thr Gly Arg Leu Thr Thr Leu Phe Pro His Glu His
                325                 330                 335

Leu Asp Pro Trp Leu Ser Thr Thr Val Gly Arg Pro Phe Pro Asp Val
            340                 345                 350

Glu Val Val Val Gly Asp Gln Glu Ser Gly Ala Pro Leu Ala Thr Gly
        355                 360                 365

Glu Val Gly Glu Val Arg Val Arg Ser Pro His Met Met Asp Gly Tyr
    370                 375                 380

Thr Gly Asp Pro Ala Ala Thr Ala Lys Val Leu Arg Asp Gly Trp Tyr
385                 390                 395                 400

His Thr Gly Asp Ile Gly Tyr Thr Asp Glu His Gly Tyr Leu His Leu
                405                 410                 415

Leu Gly Arg Val Ala Asp Val Val Lys Val Asn Gly Val Lys Val His
            420                 425                 430

Pro Thr Val Val Glu Arg Glu Leu Leu Ser Leu Ala Gly Val Arg His
        435                 440                 445

Ala Ala Val Tyr Gly Val Arg Asp Gln Asp Ala Val Glu His Leu His
    450                 455                 460

Ala Thr Ile Val Cys Asp Pro Ala Val Pro Val Glu Thr Asp Ala Ile
465                 470                 475                 480

Arg Ala His Leu Ala Gln Ser Leu Ser Gly Leu His Val Pro Glu Lys
                485                 490                 495

Ile Ser Val Val Ala Asp Leu Pro Leu Asn Asp Asn Gly Lys Pro Asp
            500                 505                 510

Lys Val Arg Leu Gln Leu Leu Asp Ser
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<210> 70
<211> 1566
<212> DNA
<213> Streptomyces aizunensis

<400> 70

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ggtgaattga ttcggtcggt gaccgaggcg ttccacgcac tgcacgacag cggcgtgcgc 180

gcgggcgatg tcgtggccat cctggtggcg cccaacagcc cggagatgct cacggcacgg 240

tacgcggcgc acctgctcgg cggcgcggtg tgctacctgc ggtccaccaa ccccggaacc 300

agcgaggtgg cccttccgct ggaccagcag atccggatcc tgcgggacac cgaggccgtg 360

accgtctaca cggacgccga gaacgcgccg cgcgccgccg aactggccgc gggcgccagt 420

ggactgcccg tgacgtgcct gacgggtgag gcgcgcaaga gggagagcgc ggaagacgct 480

ccgcgcgccc tgccgtgggc cccggatgca ctggccctca tcacgttcac cagcggcagc 540

accggacggc cgaagggcat ccggctggcg ggccgggcgt ggaacggcct ggtccagggc 600

atggtggcgg ccggcggcga agccgagggc gtcaagctcc tggtcaccac cccgttgagc 660

cacaccgtcg gcagcatggc ggacaccgcg ctggcgctgg gcggcgaggt ctacctgcac 720

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ttcatggcga cggtccatct gttccagctg ctcgaccacc tggaggagcg cggcctgaag 840

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cacaccggcg acatcggcta caccgacgaa cacggctatc tgcacctgct gggccgggtc 1260

gccgacgtgg tcaaggtcaa cggcgtcaag gtccacccga cggtggtcga acgggagctc 1320

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<210> 71
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<212> PRT
<213> Streptomyces aizunensis

<400> 71

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His Phe Pro Ser Ala Ser Ala Arg Gln Asp Gly Val Asp Ser Gln Ile
        35                  40                  45

Ser Val Trp Cys Ser Asn Asp Tyr Leu Gly Met Gly Gln Asn Pro Gln
    50                  55                  60

Val Ile Glu Ala Met Lys Lys Thr Ile Asp Thr His Gly Val Gly Ser
65                  70                  75                  80

Gly Gly Ser Arg Asn Ile Gly Gly Thr Asn His Tyr His Val Leu Leu
                85                  90                  95

Glu Ala Glu Leu Ala Asp Leu His Gly Lys Glu Ala Ala Leu Leu Phe
            100                 105                 110

Thr Ser Gly Tyr Thr Ala Asn Asp Gly Ser Leu Ser Val Leu Ala Gly
        115                 120                 125

Thr Pro Lys Asp Thr Ile Val Phe Ser Asp Glu Lys Asn His Ala Ser
    130                 135                 140

Ile Ile Asp Gly Leu Arg His Ser Gly Ala Gln Lys His Ile Phe Arg
145                 150                 155                 160

His Asn Asp Val Ala His Leu Ala Glu Leu Leu Ala Ala Ala Pro Ala
                165                 170                 175

Asp Arg Pro Lys Leu Ile Val Leu Glu Ser Val Tyr Ser Met Ser Gly
            180                 185                 190

Asp Ile Ala Pro Leu Ala Glu Ile Ala Glu Leu Ala Arg Arg Tyr Asp
        195                 200                 205

Ala Thr Thr Tyr Ile Asp Glu Val His Ala Val Gly Met Tyr Gly Pro
    210                 215                 220

Gln Gly Ala Gly Ile Ala Ala Arg Glu Gly Ile Ala Asp Gln Phe Thr
225                 230                 235                 240

Val Val Met Gly Thr Leu Ala Lys Gly Tyr Gly Thr Val Gly Gly Tyr
                245                 250                 255

Ile Ala Gly Pro Ala Ala Leu Val Asp Ala Val Arg Thr Leu Ser Arg
            260                 265                 270

Ala Phe Val Phe Thr Thr Ser Leu Pro Pro Ala Val Ala Ala Gly Ala
        275                 280                 285

Leu Glu Ala Val Arg Tyr Leu Arg Asn Ser Asp Val Glu Arg Lys Val
    290                 295                 300

Leu Ala Glu Asn Ala Gln Leu Leu His Arg Leu Leu Asp Glu Ala Asp
305                 310                 315                 320

Ile Pro Phe Ile Ser Pro Asp Ser His Ile Val Ser Ala Phe Ile Gly
                325                 330                 335

Asp Asp Glu Thr Cys Lys Gln Ala Ser Arg Leu Leu Phe Glu Arg His
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340 345 350

Gly Ile Tyr Val Gln Ser Ile Asn Ala Pro Ser Val Pro Leu Gly Gln
355 360 365

Glu Ile Leu Arg Ile Ala Pro Ser Thr Val His Gly Arg Glu Asp Val
370 375 380

Glu Asn Phe Ala Glu Ala Leu Arg Gly Ile Trp Lys Glu Leu Asn Ile
385 390 395 400

Pro Thr Ala Thr Asp Arg Asn Trp Leu Ser
405 410

<210> 72
<211> 1233
<212> DNA
<213> Streptomyces aizunensis

<400> 72
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caggacggcg tggactccca gatcagcgtc tggtgcagca acgactacct cggtatgggg 180

cagaaccccc aggtcatcga ggcgatgaag aagaccatcg acacccacgg cgtgggctcc 240

ggcggctcgc ggaacatcgg tggcaccaac cactaccacg tgctgctcga agcggagctg 300

gcggacctcc acggcaagga ggcggcgctc ctcttcacct ccggctacac ggccaacgac 360

ggttccctga gcgtcctggc cgggacgccc aaggacacga tcgtcttctc cgacgagaag 420

aaccacgcgt cgatcatcga cgggctgcgg cacagcggcg cgcagaagca catcttccgg 480

cacaacgacg tcgcgcacct ggcggagctg ctcgcggccg cccccgccga ccgtccgaag 540

ctgatcgtcc ttgagtcggt ctattcgatg tcgggcgaca tcgcgccgct ggccgagatc 600

gccgagctcg cgcgccgcta cgacgccacc acgtacatcg acgaggtgca cgcggtcggc 660

atgtacggtc cgcagggcgc cggcatcgcc gcccgtgagg gcatagccga ccagttcacc 720

gtcgtgatgg gcacgctggc caagggctac ggcaccgtcg gcggctacat tgccggtccc 780

gccgccctcg tcgacgccgt gcgcaccctg tcgcgcgcct tcgtcttcac cacctcgctg 840

ccgccggccg tcgcggcggg tgcgctggag gccgtgcgct acctccggaa ctccgacgtc 900

gagcggaagg tgctggcgga gaacgcccag ctgctgcacc ggctgctcga tgaggccgac 960

atcccgttca tctcgccgga ctcgcacatc gtctccgcct tcatcgggga cgacgagacc 1020

tgcaagcagg cgtcccggct gctcttcgag cggcacggga tctacgtcca gtccatcaac 1080

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cgcgaggacg tcgagaactt cgccgaggcc ctccgcggga tctggaaaga gctgaacatc 1200

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<210> 73
<211> 506
<212> PRT
<213> Streptomyces aizunensis

<400> 73

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Arg Leu Trp Asp Arg Ala Arg Arg Tyr Ala Ala Ala Leu Arg Gly Gln
35 40 45

Gly Ile Gly Pro Asp Asp Lys Val Ala Leu Leu Met Pro Asn Thr Pro
50 55 60

Glu Phe Ala Ala Val Tyr Phe Ala Val Leu Ala Leu Gly Ala Val Val
65 70 75 80

Val Pro Val His Thr Leu Leu Lys Pro Ala Glu Val Ser His Leu Leu
85 90 95

Arg Asp Ser Gly Ala Arg Ala Leu Val Trp Ala Gly Thr Leu Pro Gln
100 105 110

Glu Thr Ala Arg Asp Ala Gly Glu Thr Gly Val Leu Leu Leu Thr Val
115 120 125

Gly Glu Ala Leu His Gly Ser Val Leu Leu Asp Asp Gly Val Glu Pro
130 135 140

Ile Asp Thr Tyr Val Glu Arg Gly Ala Asp Asp Leu Ala Leu Val Leu
145 150 155 160

Tyr Thr Ser Gly Thr Thr Gly Arg Pro Lys Gly Ala Met Leu Thr His
165 170 175

Gly Asn Val Ala Thr Asn Ile Ala Val Thr Ala Val Ser Pro Phe Ala
180 185 190

Phe Gly Glu Asp Asp Val Leu Leu Gly Ala Leu Pro Leu Ser His Thr
195 200 205

Phe Gly Gln Ile Cys Gly Met Ala Val Thr Phe His Ala Gly Ala Thr
210 215 220

Leu Val Val Met Glu Arg Phe Glu Ala His Asp Ala Leu Arg Leu Met
225 230 235 240

Arg Glu His Gly Cys Thr Val Phe Met Gly Val Pro Thr Met Tyr His
245 250 255

Ala Leu Leu Glu Ala Val Ala Ala Gly Ala Pro Ala Pro Arg Leu Thr
260 265 270

Arg Val Tyr Ser Gly Gly Ser Ala Leu Pro Val Pro Val Leu Asp Arg
275 280 285

Val Arg Ala Ala Phe Gly Cys Glu Val Tyr Glu Gly Tyr Gly Leu Thr
290 295 300

Glu Thr Ser Pro Cys Val Ala Tyr Asn Gln Pro Gly Ile Pro Cys Lys
305 310 315 320

Pro Gly Thr Val Gly Leu Pro Ile Asp Gly Val Arg Val Ala Ile Ala
325 330 335

Asp Ala Glu Leu Glu Gly Arg Ile Arg Leu Leu Lys Gln Gly Asp Ile
340 345 350

Gly Glu Ile Val Val Ser Gly His Asn Val Met Ala Gly Tyr Leu Gly
355 360 365

Arg Pro Gln Glu Thr Ala Glu Val Leu Val Asp Gly Trp Phe Arg Thr
370 375 380

Gly Asp Met Gly Val Gln Asp Glu Asp Gly Tyr Leu Ser Ile Val Asp
385 390 395 400

Arg Lys Lys Asp Met Ile Val Arg Gly Gly Tyr Asn Val Tyr Pro Arg
405 410 415

Glu Val Glu Asp Val Leu Leu Arg His Pro Ala Val Asp Gly Ala Cys
420 425 430

Val Val Gly Val Pro Ser Val Lys His Gly Glu Glu Val Cys Ala Val
435 440 445

Val Arg Val Lys Pro Gly Gln Arg Ala Ser Gly Leu Leu Ala Glu Glu
450 455 460

Ile Val Ala Trp Ser Arg Val His Met Ala Ala Tyr Lys Tyr Pro Arg
465 470 475 480

Arg Val Glu Phe Val Glu Thr Phe Pro Leu Gly Ser Ser Gly Lys Val
485 490 495

Leu Lys Arg Glu Leu Ala His Arg Tyr Ala
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<210> 74
<211> 1521
<212> DNA
<213> Streptomyces aizunensis

<400> 74
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ccgaacaccc cggagttcgc ggcggtgtac ttcgcggtgc tcgcgctcgg cgccgtcgtc 240

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ctggcacacc gctacgcgtg a 1521

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<211> 217
<212> PRT
<213> Streptomyces aizunensis

<400> 75

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Asp Thr Pro Val Glu Ala Gln Ser Tyr Ala Asp Phe Asp Asp Leu Asp
35 40 45

Pro Phe Ser Gly Gly Gln Leu Val Ile Leu Ser Ser Asp Ala Ala Gly
50 55 60

Pro Leu Ser Ala Glu Thr Ala Glu Ser Leu Arg Thr His Glu Ile Pro
65 70 75 80

Val Leu Ile Leu Val Asp Ser Ala Ala Pro Val Glu Gln Ser Trp Ala
85 90 95

Asp Gln Ala Arg Gly Phe Leu Asp Trp Ala Asp Leu Arg Pro Asp Thr
100 105 110

Leu Arg Asp Ala Ile Ala Asp Val Ala Ala Gly Arg Phe Phe Ala Ser
115 120 125

Glu Thr Leu Ala Arg Arg Ser Val Thr Ala Ala Glu Gln Thr Glu Gly
130 135 140

Gly Thr Pro Ala Ala Arg Ser Pro Ile Thr Leu Thr Ala Arg Glu Leu
145 150 155 160

Gln Val Leu Arg Leu Ile Ala Gly Gly Leu Ser Asn Arg Gln Ile Ala
165 170 175

Arg Ser Leu Asn Ile Ser Glu His Gly Val Lys Arg Leu Val Gly Ile
180 185 190

Val Leu Ala Lys Leu Asn Cys Pro Asn Arg Thr Leu Ala Val Val Arg
195 200 205

Ala Ile Asp Ala Gly Leu Leu Thr Leu
210 215

<210> 76
<211> 654
<212> DNA
<213> Streptomyces aizunensis

<400> 76
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tacgcggatt tcgatgatct cgacccccttc tccggaggcc agttggtcat cctctccagt 180

gatgcggcgg gtcccctctc cgccgagacc gccgaaagcc tgcggacgca tgagataccc 240

gtgctgatcc tggtcgactc ggccgccccg gtcgagcagt cctgggccga ccaggcgcgc 300

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<210> 77
<211> 442
<212> PRT
<213> Streptomyces aizunensis

<400> 77

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20 25 30

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Thr Gly Pro Gly Gly Pro Pro Ala Ala Ala Asp Ser Gln Ile Thr Leu
        35                  40                  45

Arg Ser Pro Ala Glu Leu Ala Asp Ala Leu Pro Tyr Met Leu Gly Phe
    50                  55                  60

His Pro Thr Asp Ser Leu Val Met Val Ala Leu His Gly Glu Gly Gly
65                  70                  75                  80

Arg Phe Gly Gly Arg Leu Arg Val Gly Ile Pro Thr Asp Arg Gly Glu
                85                  90                  95

Trp Glu Asp Thr Ala Arg Gln Val Ala Asp Cys Leu Val His Gly Ser
            100                 105                 110

Glu Arg Arg Gly Gly Lys Pro Asp Gly Ile Val Val Phe Leu Cys Gln
        115                 120                 125

Asp Pro Arg Gly Gly Glu Ser Gly Gln Arg Val Met Thr Arg Leu Arg
    130                 135                 140

Pro Leu Ala Gln Arg Ile Arg Leu Ala Cys Gly Ala Leu Asp Val Pro
145                 150                 155                 160

Val Leu Glu Ala Leu Cys Leu Ser Gly Gly Arg Tyr Trp Ser Tyr Cys
                165                 170                 175

Cys Pro Asp Ala Arg Cys Cys Pro Ala Glu Gly Thr Ala Leu Thr Val
            180                 185                 190

Pro Gly Thr Ser Val Met Ala Ala Ala Ala Thr Tyr Ala Gly Leu Arg
        195                 200                 205

Val Arg Gly Ser Leu Gln Glu Ile Glu Gly Arg Leu Ala Pro Leu Arg
    210                 215                 220

Gly Pro Leu Ala Asp Glu Gln Glu Arg Ser Leu Asp Leu Ala Ala Thr
225                 230                 235                 240

Ala Leu Val Pro Lys Ile Leu Asp Gly Ala Thr Arg Glu Asp Val Gly
                245                 250                 255

Ala Asp Thr Leu Glu Leu Ala Arg Thr Leu Met Arg Arg Leu Thr Leu
            260                 265                 270

Ala Pro Pro Ala Asp Gly Gly Pro Cys Ala Glu Asp Trp Asp Asp Ala
        275                 280                 285

Leu Leu Gly His Asp Glu Ala Ala Ser Leu Ile Leu Gly Leu Gln Asp
    290                 295                 300

Arg Glu Ile Arg Asp Ile Ala Ala Glu Trp Met Glu Gly Glu Glu Ala
305                 310                 315                 320

Ala Pro Ala Leu Arg Leu Trp Arg Ala Leu Ala Arg Arg Cys Val Gly
                325                 330                 335

Ala Tyr Gly Glu His Ala Ala Ala Pro Leu Thr Leu Ala Gly Trp Val
            340                 345                 350

Ser Trp Ser Thr Gly Asp Glu Pro Thr Ala Arg Ile Ala Leu Gly Met
        355                 360                 365
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Ala Leu Arg Ala Asp Ala Asp Tyr Arg Phe Ala Gln Leu Leu His His
370 375 380

Ala Cys Asn Glu Gly Ile Asp Pro Glu Gly Leu Arg Glu Cys Leu Arg
385 390 395 400

Ala Glu Arg Gly Arg Arg Glu Pro Arg Arg Ala Arg Ala Ala Ala Val
405 410 415

Thr Arg Pro Pro Gly Arg Arg Pro Arg Thr Thr Arg Pro Ala Pro Arg
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Asp Arg Arg Arg Thr Ala Gly Ser Glu Gln
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<210> 78
<211> 1329
<212> DNA
<213> Streptomyces aizunensis

<400> 78
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gccgccgact cacagatcac cctgcgcagc ccggccgaac tggccgacgc cctgccctac 180

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accgcccgca tcgccctggg aatggccctg cgggccgacg ccgactaccg cttcgcccaa 1140

ctcctccacc acgcctgcaa cgaaggcatc gacccggagg gactgcggga gtgcctgcgc 1200

gcggagcggg gacggcggga gccgcgccgc gcccgggcgg ccgccgtcac ccggccgccg 1260

gggcggcgtc cccggaccac ccgccccgca ccccgtgacc ggcgccgcac ggcggggagc 1320

gagcagtga 1329

0-1	**Form - PCT/RO/134 (EASY) Indications Relating to Deposited Microorganism(s) or Other Biological Material (PCT Rule 13bis)**	
0-1-1	Prepared using	PCT-EASY Version 2.92 (updated 01.04.2003)
0-2	**International Application No.**	PCT/CA2004/000068
0-3	**Applicant's or agent's file reference**	30048PCT

1	**The indications made below relate to the deposited microorganism(s) or other biological material referred to in the description on:**	
1-1	page	45
1-2	line	4
1-3	**Identification of Deposit**	
1-3-1	Name of depositary institution	National Microbiology Laboratory, Health Canada
1-3-2	Address of depositary institution	Federal Laboratories for Health Canada, Room H5190, 1015 Arlington Street, Winnipeg, Manitoba, Canada R3E 3R2
1-3-3	Date of deposit	07 August 2003 (07.08.2003)
1-3-4	Accession Number	NMLHC IDAC 070803-01
1-4	**Additional Indications**	A request to restrict access to a sample of any deposit of biological material pertaining to the above noted International application is made with respect to all designated states having enacted any such provisions in their respective national legislation. Australia Notice under Regulation 3.25 (3); CBE Rule 28(4); Canadian Patent Rules, Section 104(4) Notice.
1-5	**Designated States for Which Indications are Made**	all designated States
1-6	**Separate Furnishing of Indications** These indications will be submitted to the International Bureau later	NONE
2	**The indications made below relate to the deposited microorganism(s) or other biological material referred to in the description on:**	
2-1	page	45
2-2	line	10

2-3	**Identification of Deposit**	
2-3-1	Name of depositary institution	National Microbiology Laboratory, Health Canada
2-3-2	Address of depositary institution	Federal Laboratories for Health Canada, Room H5190, 1015 Arlington Street, Winnipeg, Manitoba, Canada R3E 3R2
2-3-3	Date of deposit	23 December 2003 (23.12.2003)
2-3-4	Accession Number	NMLHC IDAC 231203-02
2-4	**Additional Indications**	A request to restrict access to a sample of any deposit of biological material pertaining to the above noted International application is made with respect to all designated states having enacted any such provisions in their respective national legislation. Australia Notice under Regulation 3.25 (3); CBE Rule 28(4); Canadian Patent Rules, Section 104(4) Notice.
2-5	**Designated States for Which Indications are Made**	all designated States
2-6	**Separate Furnishing of Indications** These indications will be submitted to the International Bureau later	NONE
3	**The indications made below relate to the deposited microorganism(s) or other biological material referred to in the description on:**	
3-1	page	44
3-2	line	27
3-3	**Identification of Deposit**	
3-3-1	Name of depositary institution	National Microbiology Laboratory, Health Canada
3-3-2	Address of depositary institution	Federal Laboratories for Health Canada, Room H5190, 1015 Arlington Street, Winnipeg, Manitoba, Canada R3E 3R2
3-3-3	Date of deposit	25 February 2003 (25.02.2003)
3-3-4	Accession Number	NMLHC IDAC 250203-01
3-4	**Additional Indications**	A request to restrict access to a sample of any deposit of biological material pertaining to the above noted International application is made with respect to all designated states having enacted any such provisions in their respective national legislation. Australia Notice under Regulation 3.25 (3); CBE Rule 28(4); Canadian Patent Rules, Section 104(4) Notice.

3-5	**Designated States for Which Indications are Made**	all designated States
3-6	**Separate Furnishing of Indications** These indications will be submitted to the International Bureau later	NONE
4	**The indications made below relate to the deposited microorganism(s) or other biological material referred to in the description on:**	
4-1	page	44
4-2	line	27
4-3	**Identification of Deposit**	
4-3-1	Name of depositary institution	National Microbiology Laboratory, Health Canada
4-3-2	Address of depositary institution	Federal Laboratories for Health Canada, Room H5190, 1015 Arlington Street, Winnipeg, Manitoba, Canada R3E 3R2
4-3-3	Date of deposit	25 February 2003 (25.02.2003)
4-3-4	Accession Number	NMLHC IDAC 250203-02
4-4	**Additional Indications**	A request to restrict access to a sample of any deposit of biological material pertaining to the above noted International application is made with respect to all designated states having enacted any such provisions in their respective national legislation. Australia Notice under Regulation 3.25 (3); CBE Rule 28(4); Canadian Patent Rules, Section 104(4) Notice.
4-5	**Designated States for Which Indications are Made**	all designated States
4-6	**Separate Furnishing of Indications** These indications will be submitted to the International Bureau later	NONE
5	**The indications made below relate to the deposited microorganism(s) or other biological material referred to in the description on:**	
5-1	page	44
5-2	line	27
5-3	**Identification of Deposit**	
5-3-1	Name of depositary institution	National Microbiology Laboratory, Health Canada
5-3-2	Address of depositary institution	Federal Laboratories for Health Canada, Room H5190, 1015 Arlington Street, Winnipeg, Manitoba, Canada R3E 3R2
5-3-3	Date of deposit	25 February 2003 (25.02.2003)
5-3-4	Accession Number	NMLHC IDAC 250203-03

5-4	**Additional Indications**	A request to restrict access to a sample of any deposit of biological material pertaining to the above noted International application is made with respect to all designated states having enacted any such provisions in their respective national legislation. Australia Notice under Regulation 3.25 (3); CBE Rule 28(4); Canadian Patent Rules, Section 104(4) Notice.
5-5	**Designated States for Which Indications are Made**	all designated States
5-6	**Separate Furnishing of Indications** These indications will be submitted to the International Bureau later	NONE
6	**The indications made below relate to the deposited microorganism(s) or other biological material referred to in the description on:**	
6-1	page	44
6-2	line	27
6-3	**Identification of Deposit**	
6-3-1	Name of depositary institution	National Microbiology Laboratory, Health Canada
6-3-2	Address of depositary institution	Federal Laboratories for Health Canada, Room H5190, 1015 Arlington Street, Winnipeg, Manitoba, Canada R3E 3R2
6-3-3	Date of deposit	25 February 2003 (25.02.2003)
6-3-4	Accession Number	NMLHC IDAC 250203-04
6-4	**Additional Indications**	A request to restrict access to a sample of any deposit of biological material pertaining to the above noted International application is made with respect to all designated states having enacted any such provisions in their respective national legislation. Australia Notice under Regulation 3.25 (3); CBE Rule 28(4); Canadian Patent Rules, Section 104(4) Notice.
6-5	**Designated States for Which Indications are Made**	all designated States
6-6	**Separate Furnishing of Indications** These indications will be submitted to the International Bureau later	NONE
7	**The indications made below relate to the deposited microorganism(s) or other biological material referred to in the description on:**	
7-1	page	44
7-2	line	28

7-3	**Identification of Deposit**	
7-3-1	Name of depositary institution	National Microbiology Laboratory, Health Canada
7-3-2	Address of depositary institution	Federal Laboratories for Health Canada, Room H5190, 1015 Arlington Street, Winnipeg, Manitoba, Canada R3E 3R2
7-3-3	Date of deposit	25 February 2003 (25.02.2003)
7-3-4	Accession Number	NMLHC IDAC 250203-05
7-4	**Additional Indications**	A request to restrict access to a sample of any deposit of biological material pertaining to the above noted International application is made with respect to all designated states having enacted any such provisions in their respective national legislation. Australia Notice under Regulation 3.25 (3); CBE Rule 28(4); Canadian Patent Rules, Section 104(4) Notice.
7-5	**Designated States for Which Indications are Made**	all designated States
7-6	**Separate Furnishing of Indications** These indications will be submitted to the International Bureau later	NONE

FOR RECEIVING OFFICE USE ONLY

0-4	**This form was received with the international application:** (yes or no)	yes
0-4-1	Authorized officer	Chantal Hébert

FOR INTERNATIONAL BUREAU USE ONLY

0-5	**This form was received by the international Bureau on:**	
0-5-1	Authorized officer	

INTERNATIONAL SEARCH REPORT

International Application No
PCT/CA2004/000068

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 C07H15/203 C07H15/26 C07H15/10 C07C229/30 C07C237/16
C12P19/44 A61K31/7032 A61P31/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 C07H C07C C12P A61K A61P

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
BIOSIS, EPO-Internal, BEILSTEIN Data, EMBASE, WPI Data, CHEM ABS Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	SAKUDA S ET AL: "NOVEL LINEAR POLYENE ANTIBIOTICS: LINEARMYCINS" JOURNAL OF THE CHEMICAL SOCIETY, PERKIN TRANSACTIONS 1, CHEMICAL SOCIETY. LETCHWORTH, GB, no. 18, 1996, pages 2315-2319, XP001189502 ISSN: 0300-922X cited in the application page 2317 ---	1-29
X	CA 2 352 451 A (ECOPIA BIOSCIENCES INC) 28 October 2001 (2001-10-28) page 24 ---	14,15
P,X	WO 03/062458 A (ZAZOPOULOS EMMANUEL ;FARNET CHRIS M (CA); STAFFA ALFREDO (CA); WON) 31 July 2003 (2003-07-31) page 58 -----	1-5,7-9, 11-19,24

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
2 June 2004	11/06/2004

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Steendijk, M

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/CA2004/000068

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
CA 2352451 A	28-10-2001	CA 2352451 A1	28-10-2001
WO 03062458 A	31-07-2003	WO 03062458 A2	31-07-2003
		CA 2414570 A1	03-04-2003
		US 2003180766 A1	25-09-2003